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The Design of a Middle School Manual to Aid Core Teachers in the Development of Integrated Curriculum Units

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THE DESIGN OF A MIDDLE SCHOOL MANUAL TO AID CORE TEACHERS IN THE DEVELOPMENT OF INTEGRATED CURRICULUM UNITS

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by

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This project purports to design a manual for middle-school teachers to aid in the development of core-integrated curriculum units. The manual will serve as an ally to the knowledge in textbooks, technology bases, and other available printed and nonprinted library and classroom resources. It will illustrate specific ways to integrate core curriculum knowledge and activities.

The manual is intended for use by school-based subject core teachers by providing a common field of knowledge on the development of integrated curriculum units for middle level grades. The manual will enable educators to develop integrated core curriculum units that utilize themes and knowledge from a variety of resources, including current textbooks and printed and nonprinted library resources. Teachers will be encouraged to tie this knowledge in to community resources and to intentionally and contextually restructure teaching and learning.

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CHAPTER I

INTRODUCTION

To the young mind everything is individual, stands by itself. By and by, it finds how to join two things and see in them one nature; then three, then three thousand... discovering roots running underground whereby contrary and remote things cohere and flower out from one stem...The astronomer discovers that geometry, a pure abstraction of the human mind, is the measure of planetary motion. The chemist finds proportions and intelligible method throughout matter; and science is nothing but the finding of analogy, identity, in the most remote parts.

-- Emerson

As educators we need to consider and foster a learning environment in which young people see and understand how life and learning are interrelated. As stated by Kathleen and James Strickland, teachers often find themselves working with structures imposed by others that may or may not show interrelatedness. Integrated units of instruction reflect "thinking, goals, and concepts that are common to different subject areas, and the topics chosen for

the units are often broadly required by the district or the department."

The learning process is not an accumulation of skills but a meaning-making process. Learning should become a way to communicate thoughts, ideas, and feelings. Teachers should "use student needs to drive instruction rather than depending on a set curriculum or program...cover the curriculum but still meet student needs and interests" (Strickland, p. 136).

Students should be able to apply their knowledge to understanding and the solving of related problems. Eurich (1993) stated that students seldom see the results of their study, since the "real" world is a world of issues, topics, problems, and situations -- not disciplines, subjects, or courses. "There is little tangible evidence of a connection, and often no one troubles to explain the subject's value for later application" (p. 78).

James A. Beane states that integration centers the curriculum on life itself rather than on the mastery of fragmented information within the boundaries of subject areas. It is rooted in a view of learning as the continuous integration of new knowledge and experience so as to deepen and broaden understanding of ourselves and our world. Its focus is on life as it is lived now rather than on preparation for some later life or later level of schooling. It serves the young people for whom the curriculum is intended rather than the specialized interests of adults. It concerns the active construction of meanings rather than the passive assimilation of others' meanings (Beane; April, 1995).

Purpose of the Project

This project purports to design a manual for middle-school teachers to aid in the development of core-integrated curriculum units. The manual will serve as an ally to the knowledge in textbooks, technology bases, and other available printed and nonprinted library and classroom resources. It will illustrate specific ways to integrate core curriculum knowledge and activities.

The manual is intended for use by school-based subject core teachers by providing a common field of knowledge on the development of integrated curriculum units for middle level grades. The manual will enable educators to develop integrated core curriculum units that utilize themes and knowledge from a variety of resources, including current textbooks and printed and nonprinted library resources. Teachers will be encouraged to tie this knowledge in to community resources and to intentionally and contextually restructure teaching and learning.

Limitations of the Study

1. *Scope:* The manual addresses only core subject area units: Math, Social Studies, Language Arts, and Science.

2. *Target Population:* The manual is designed for use by only middle-school core-subject teachers (Grades 6, 7, and 8) from Olylmpic Middle School in Aluburn School District 408.

3. *Research:* The preponderance of research and literature reviewed for the purpose of this study is limited to the past ten (10) years.

Definitions of Terms

Significant terms used in the context of this project are defined as follows:

1. *Core curriculum*: The disciplines of language arts, social studies, math, and science.

2. *Connected curriculum:* When teachers fuse academic disciplines in order to teach important content more effectively (Beane; April, 1995).

3. *Interdisciplinary curriculum, curriculum integration, integrated curriculum:* The weaving or blending together of content from separate disciplines or within subjects so that a unifying concept, principle, problem, issue, or generalization is more clearly illuminated (Erickson, 1993).

4. *Thematic approach:* Curriculum application that is used as a basis to integrate classes in which students find connections between subjects and learn basic activities centered on a theme

that links learning to the larger social context in which they live (Beane; April, 1995).

5. *Discipline of knowledge:* A field of inquiry about some aspect of the world that connects with other disciplines to create interdisciplinary fields and projects (Beane; April, 1995).

6. *Trans-adolescents:* Students in transition between elementary school and high school (usually grades, six, seven, and eight), who are undergoing a unique period of growth and development physically, socially, and intellectually (Wiles and Bondi, 1993).

CHAPTER II

REVIEW OF RELATED LITERATURE

The review of research and literature in the following pages is organized to address and discuss:

1. Rationale and implications of curriculum integration using a thematic approach.
2. Guiding principles, instructional patterns, and curriculum integration strategies of middle schools.
3. Research on learning and thinking patterns that support the rationale for the use of curriculum integration.
4. Summary.

Rationale and Implications for Curriculum Integration Using a Thematic Approach

Vars (1987) states that "Interweaving the threads of learning through interdisciplinary curriculum and teaching invites students and teachers to investigate a theme by examining it from many different perspectives -- those of traditional disciplines of knowledge as well as through lenses of organizing ideas" (p. 1).

"AMERICA 2000: An Education Strategy" (1992) is a crusade to

redesign and reconceptualize education. AMERICA 2000 encourages a concept of curriculum and teaching in which "big" ideas rather than a collection of facts become the organizing themes of curriculum design and development.

According to Martinello and Cook (1992), "Such studies, with questions formulated from the perspectives of several different fields of study, encourage students to think in similar ways about different subjects. Interdisciplinary studies guide students to use those common processes within and across the relevant subject areas, ensuring a more thorough study of thematic concepts and generalizations. Most important, they develop students' abilities to inquire" (p. 2).

Martinello and Cook emphasize the characteristics of theme studies that clearly distinguish them from other forms of interdisciplinary curriculum:

1. They are broad, with many subtopics, and are dedicated to developing students' critical and creative thinking and ways of knowing that are significant for learning in all the traditional disciplines.

2. They represent the content and process of what students are expected to learn in school; they are not "add-ons" or "special events" in the curriculum.

3. During their development they often are the most important

study focus of students and teachers.

4. They incorporate many traditional subject areas in ways that maintain the integrity of each discipline.

5. Each is developed over an extended period of time through the study of many subtopics within the theme: studies are question-driven, and students are involved in searching for answers, often using primary sources.

6. The entire community becomes the learning laboratory for theme studies, providing diverse resources for exploring questions derived from the theme.

7. They offer learning opportunities for students at different developmental levels and with varying abilities.

8. They encourage differentiated and diversified learning activities and assignments.

9. The evaluation of student growth is ongoing and formative and uses alternative methods of teacher assessment and learner self-assessment (p. 1).

Wiles and Bondi (1994) state that our interdisciplinary approach is a way of organizing the school in terms of curriculum, instruction,

and resources, both human and material. Interdisciplinary middle level education requires an organization that encourages teachers to team so they will view their students' capabilities and needs from the several perspectives of those who teach and guide them. Traditional disciplines of knowledge are investigated through examination of a theme that focuses studies on student learning.

Disciplines do not lose their integrity through a team approach. Rather, the interdisciplinary approach clearly demonstrates the uniqueness of each discipline's contribution to the solution of problems. The teacher still needs to be the guide in order for learning to take place, but teaming and interdisciplinary teaching require teachers and students to learn differently in a new way (p. 49).

Realizing the need to rethink teacher training in order to meet the needs of the middle school student, the National Association of Secondary School Principals (NASSP) brought together five of the nation's foremost researchers in early adolescent education to form the association's Middle Level Council. These leaders were Alfred A. Arth, J. Howard Johnston, John H. Lousbury, Conrad F. Toepfer, Jr., and George E. Melton. The council's task was to examine educational programs and practices for young adolescents and to make recommendations for improvement. An *Agenda for Excellence at the Middle Level* (1994) was developed to address the critical elements of effective middle level schooling.

According to a statement by NASSP's Council on Middle Level Education (1993), the curriculum must "balance skill development with content coverage, which may be outdated before it is used."

To prepare youth for the future, the middle level school curriculum must develop intellectual skills and an understanding of humankind that will permit the student to gather information, organize it in a meaningful fashion, evaluate its veracity and utility, form reasonable conclusions about it, and plan for individual and collective action (p. 5).

The Council on Middle Level Education further postulates that beyond consideration for its content, curriculum organization must be given careful attention. The Council believes curriculum must be organized to allow students to connect the materials and skills learned in one class to solve problems presented in another. It must recognize the wide divergence in student development at this level, including biological and neurological differences and subsequent differences in thinking capacities and strategies (p. 6).

Finally, the Council members contend that the curriculum must be related to clearly articulated goals shared by teachers, administrators, students, and parents. More and more educators are coming to realize that curriculum mediates the relationship between teachers and young people (p. 7).

In materials published by the Association of Supervision and Curriculum Development, (Hughes, 1991) four attributes of an integrated curriculum were identified:

1. Provides learning experiences that are more closely attuned to the way children and adults learn.

2. Encourages students to construct meaning, gain insights, and use new knowledge.
3. Requires and promotes higher-order thinking and transference of concepts across disciplines.
4. Is interactive: "The curriculum itself, as well as the student's experience, is an evolutionary outcome of a cyclical learning process that involves successive stages of problem formulation, concept formation, application, evaluation, reflection, celebration, and modification" (p. II.125).

According to James A. Beane (1995), "Creating a curriculum for and with young people begins with an examination of the problems, issues, and concerns of life as it is being lived in the real world. Organizing themes are drawn from that examination. To work through such themes, to broaden and deepen our understanding of ourselves and our world, and to communicate those meanings, we must necessarily draw on the disciplines of knowledge. Again, therein lies much of what we know about ourselves and our world, ways in which we might explore them further, and possibilities for communicating meanings" (p. 617).

Compton and Hawn (1993) stressed, "An interdisciplinary approach to the curriculum has been supported by many middle school proponents from the earliest days of the middle school movement (Alexander, William, Compton, Hines, Prescott, and Kealy,

1969; Eichhorn, 1972). In recent years those who were concerned about appropriate curriculum for middle schools proposed that in order to truly meet the needs of early adolescents, an interdisciplinary approach is absolutely essential (Arhar, 1992; Davies, 1992; Carnegie Council on Adolescent Development's Task Force on Education of Young Adolescents, 1989; McDonough, 1991). Studies by Davies (1992), Erb and Doda (1990), Vars (1987), and Lounsbury (1992, p. 19) document the educational benefits of interdisciplinary teaming.

Glatthorn (1994) supported the need to integrate curriculum regardless of the approach utilized. He stated, "In developing a rationale to support integration, you can turn both to research and theoretical arguments. In general, research supports the use of integrated curriculum" (p. 92). Glatthorn observed that the majority of more than eighty normative and comparative studies concludes that students in various types of integrated programs performed as well as or better than students studying separate subjects.

Glatthorn cited four theoretical arguments in support of integrated curriculum:

1. The real world is integrated, not fragmented or compartmentalized.
2. Students learn best when learning is connected to what they know or are interested in.
3. Integrated curriculum helps to save some time during the day.

4. Research conducted on brain activity suggests that the brain better retains and readily recalls knowledge that is patterned and holistic (p. 92).

Beane (1990) proposed a "middle school curriculum organized around a progressing series of themes and issues that reflect the developmental characteristics and needs of students" (p. 4). He pointed out that the problems one encounters in life are not neatly categorized into the realm of one, or more, content area.

This approach is supported by Messick and Reynolds (1992), who stated, "Relevance is increased when students can, first, apply knowledge to real-life situations that by nature are themselves interdisciplinary and, second, carry our problem-solving that requires addressing content from different perspectives" (p. 164).

Connelly and Clandinin (1988) suggested that "when we set our imaginations free from the narrow notion that a course of study is a series of textbooks or a specific outline of topics to be covered and objectives to be attained, broader and more meaningful notions emerge. A curriculum can become one's life course of action."

Adjusting the curriculum to the participating students' and teachers' life courses of action enhances relationships and gives meaning to the educational process.

The interdisciplinary curriculum helps students know the relevance of their efforts to learn. Jenkins (1992) states that learning involves the integration of new knowledge with previously developed knowledge. Effective learners are much better at integrating new

knowledge with old, and much better at relating knowledge intelligently to new situations. Learners must be encouraged to see relationships among knowledge bases and to continuously create bridges of their own between facts and learning (p. 104).

Tanner and Tanner (1987) stated, "Facts are not synonymous with knowledge; they must be transformed into the working power of intelligence. The responsibility for designing and developing the curriculum resides with the professional staff of the school district and school...Curriculum development is seen as a holistic and continuous process" (p. 523).

The challenge is not simply to adopt innovative teaching techniques or to find new locations for learning. The challenge is to present new learning in a way that is significant and meaningful to students.

Guiding Principles, Instructional Patterns, and Curriculum Integration Strategies of Middle Schools

Steven S. Means (1992) outlined guiding principles set forth by staff from Sammamish School in Bellevue, Washington, that focused on the learner and the holistic integration of learning as follows:

1. Emphasize writing skills in all subjects.
2. Provide a friendly transition to high school for incoming students.
3. Communicate well with parents.

4. Teach critical thinking skills.
5. Teach study and learning skills.
6. Develop each student's commitment to the community.
7. Extend activities of the classroom to the school, home, and community.
8. Develop teaching strategies that increase each teacher's job satisfaction.
9. Monitor student progress cooperatively; teachers work together.
10. Provide a wide variety of adult role models, of adults seen as learners.
11. Foster and monitor each student's emotional and personal growth.
12. Provide expectations that are consistent across the disciplines (p. 17).

John M. Jenkins (1992) felt that "because of the knowledge explosion it is impossible to learn all there is to know in any one discipline. Organizing the school curriculum around major themes, ideas, and problems may not only be more sensible from the point of view of student learning but from the point of view of survival" (p. 102).

Common sense and imagination go hand in hand when developing interdisciplinary programs. In reviewing a number of middle school programs that designed their curriculum to bridge the gap between traditional subjects and to make learning more relevant to the

student clientele, several common threads are suggested irrespective of school level or subject area.

John M. Jenkins (1992) outlined five criteria that provide direction for planning and implementing interdisciplinary curriculum and instruction at a middle school level:

*Teaming
*Flexible scheduling
*Different roles for teachers
*Support from the principal
*Commitment (pp. 102-103).

It is appropriate and necessary to take a new look at curriculum with the focus on reducing the number of separate but related subjects. The traditional subject-centered school is replaced with a camaraderie among members of a team that transcends individual personalities and uses the strengths of team members to improve curriculum advantageously . Now teaching becomes more student-centered.

Wiles and Bondi (1989) stated, "Curriculum development is a process of development that creates educational experiences to meet the intentions of planners. The basic tasks of curriculum work have been clearly defined during this century. Using an *if-then* logic, curriculum development identifies purpose, sets goals and objectives, aligns curriculum content, focuses on critical needs of learners, and delivers a program" (p. 113).

Compton and Hawn (1993) propose that teachers of middle level students should coordinate curriculums among subject areas so that students can relate one subject to another. The advantage of the interdisciplinary team approach is that it enables teachers to apply a variety of teaching techniques. Knowledge of this unique stage in life and the special needs it presents must be incorporated into teaching and learning. Interdisciplinary team members do more than just cover a topic or get through the period; they relate activities to a student environment with a wide range of individual physical, emotional, social, and intellectual differences and experiences. Connecting lessons to other subjects appeals to student imagination and adds value to the activity (p. 19).

Toepfer (1991) states that middle level adolescents learn best when they can see the importance of facts, skills, and information from classroom lessons in their lives. Successful middle school teachers relate the information they teach to that taught in other areas. They also communicate its importance to issues facing students now and in the future.

Middle school students are highly interested in a wide range of topics. Interest also results from their activities, their immediate world, the media, and their vision of the adult world. The integration of specific subject area skills and interests, as well as intellectual needs, of the middle level student must be presented in a wide range of formats that successfully meet the needs of the trans-adolescent (p. 25).

"The most common recommendation for effecting the

transformation from fragmented, departmentalized, or isolated instructional periods to integrated contexts is to develop a theme approach...so students and teachers have a focus and a rubric for making decisions and meaningful connections across content or skills" (Lipson, et. al.; 1993).

Curriculum integration is not about doing the same things differently but restructuring the separate-subject approach to curriculum. This shift will change *what* we do and *why*.

James A. Beane (1995) reported, "Curriculum integration centers the curriculum on life itself rather than on the mastery of fragmented information within the boundaries of subject areas. It is rooted in a view of learning as the continuous integration of new knowledge and experience so as to deepen and broaden our understanding of ourselves and our world. Its focus is on life as it is lived now rather than on preparation for some later life or later level of schooling. It serves the young people for whom the curriculum is intended rather than the specialized interests of adults. It concerns the active construction of meanings rather than the passive assimilation of others' meaning...to advocates of curriculum integration, the disciplines of knowledge are clearly *not* the enemies of curriculum integration" (p. 622).

Middle level curriculum is offered to students who are distinguished by the degree to which they differ from one another. The individual differences of early adolescents must be recognized in making decisions about the content to be taught in middle grades. Curriculums are planned for groups on assumptions about

the commonality of the needs and interests of each group. Student participation in planning the curriculum is important, and consideration should be given to individual needs and interests.

An example of curriculum planning that expands students' critical, creative, and reflective skills came from Marquette Middle School in Madison, Wisconsin. A group of teachers carried out a thematic unit that followed the new curriculum vision almost literally. The resulting curriculum design and implementation helped teachers focus successfully on key instructional skills across the content areas. These are the skills that students will need to be successful citizens of whatever world their future holds.

Beane (1991) observed, "The unit began with the students listing questions about themselves and their world and then identifying a number of themes that those questions suggested. The students then selected one theme, "Living in the Future," and listed possible activities they might use to answer the questions related to it. As part of the planning, the students also named the knowledge and skills they would need to answer their question" (p. II).

Planning appropriate learning experiences for early adolescents is a complex and difficult task. Wiles, Bondi, and Associates suggested the following planning cycle:

1. Select a theme.
2. Work independently.
3. Meet together; define objectives for a unit.
4. Meet together; select activities.

5. Brainstorm resources.
6. Develop activities, individually and collectively.
7. Schedule the unit.
8. Advertise the unit.
9. Implement the unit.
10. Evaluate the unit (p. 6).

Integrated curriculum can assume a variety of forms. Messick and Reynolds (1992) offered the following steps that teachers can take in the interdisciplinary unit planning process:

1. Select themes for integrating subject areas or topics, or decide on a distinct topic for instruction.

2. Brainstorm by using techniques of concept mapping or idea listing.

3. Identify places on the concept map or in the list where opportunities exist for incorporating specific teaching processes or thinking skills. Note areas that have prerequisite knowledge.

4. Select main concepts and identify supporting examples and factual content.

5. Determine a time line, teaching responsibilities, and

specific learning outcomes. Draft matching evaluation strategies.

6. Delineate specific teaching strategies, sequences, materials, and assignments. Recheck for emphasis main concepts, avoiding an overloading of facts. Also check for higher-order thinking skills.

7. Make adequate plans for organization of time, space, materials, and movement in order to ensure success and reduce changes for management or discipline problems.

8. Include planning ways to assess your own teaching techniques, including self-check lists, videotaping, and collegial observation (p. 195-196).

Kathleen and James Strickland (1993) offered additional suggestions on how to plan a thematic unit. Paraphrased, they suggested that before beginning a cross-discipline unit, teachers and students must plan together.

A good way to begin to conceptualize the unit is to use webbing, a brainstorming of free-associated words that defines the topic by identifying categories and subcategories. Brainstorming helps teachers and students identify resources that will be needed, set up time schedules, and generate student groups to conduct research

areas of common interest.

After generating such a list, they go on to suggest that the students and teachers use the ideas to construct a web, a pictorial representation of relationships. There is no "right way" to set up integrated units, but they offer the following guidelines to teachers in developing integrated units:

1. When using a novel as the core of a unit, talk to the students first to make sure the majority of them have not read it previously, and be prepared to suggest novels or nonfiction that might be appropriate and interesting to students.

2. Use the school's required curriculum as well as student-interest surveys to help choose an appropriate topic of study. The theme should have many possible connections and be appropriate for conceptual learning, working independently and in groups. It should naturally and meaningfully tie in with several areas of the curriculum. Remember, themes emerge from student interest.

3. Compile a web or semantic map according to academic subjects or topics, and begin to brainstorm how each subject could appropriately relate to the theme.

4. Compile goals and objectives for the integrated unit. The overall goal should be broad, and the objectives will develop

from both teacher and students.

5. Plan possible activities that would be appropriate to meet each objective. It is the teacher's responsibility to facilitate learning; therefore these planned activities are possibilities. Planning for any unit should be flexible and open to change according to the needs presented as the students become engaged and involved in the topic.

6. Gather resources (books, maps, audio-visual material, software, speakers, etc.), and create centers or resource areas. Although units will begin with materials anticipated for each content area, resources will grow as the students add others that they discover during the unit.

7. Engage students in various activities throughout the class and the unit. Be flexible in scheduling. As students participate in individual and group projects, plan to assess their needs, evaluate their strengths and weaknesses of activities, and adjust the teaching plans to meet the needs of the students.

8. Design a daily schedule to help plan ways to teach language across the curricula, providing opportunities for students to experiment, research, think, discuss, and question as they read, write, and learn. Remember that learning is a process, and these activities are not isolated lessons. Let philosophy

guide planning.

9. Assessment is an ongoing part of teaching. Think about how to assess the progress of the students so that assessment "drives" daily teaching plans. Evaluation is an end product of ongoing assessment, and the best evaluation involves both the students and the teacher. Include assessment and evaluation strategies for each content area in the unit, and when doing so, refer back to the objectives.

10. Integrated units involve a great deal of work on everyone's part, but they are exciting nevertheless. Consider a culminating activity that would be a celebration of what was learned and that could be shared with parents and/or others in the building (pp. 124-125).

Philip Panaritis (1995) commented, "There is no single, foolproof recipe for successfully implementing an interdisciplinary program, and of course, no interdisciplinary model comes with a guarantee. The nature of success is as diverse as the settings, goals, capabilities, and personalities of the people who created the program. Nevertheless, the results of research and the lessons of practical experience strongly suggest that successful programs share some key beliefs about teaching and learning and, as a result, are able to avoid some of the pitfalls lurking along the interdisciplinary path" (p. 624).

Panaritis continued by listing the following important ingredients

for success:

*Time to learn, plan, implement, and evaluate as a team;
*Resources to nurture, sustain, and expand the program;
*Incentives to acknowledge, support, and reward participants;
*Talented and committed teachers to get the program off the ground; and
*Patience and flexibility to develop the program effectively and fully (p. 624).

Panaritis warned that a place to start is with the planning of a single two- or three-day curriculum unit around a tightly focused "essential question" or clear-cut theme. The process of successfully integrating "just" two or three days' worth of homework, applications, assessment, and resources usually requires considerably more time and energy than most people imagine. The team doesn't have to, and probably shouldn't, integrate every day or in all subjects (p. 624).

Research on Learning and Thinking Patterns that Supports the Rationale for the Use of Curriculum Integration

An integrated, thematic approach also reflects the most recent research on how the brain comes to know. Peters, Schubeck, and Hopkins (1995) state there are two ways that we remember new information.

The traditional classroom emphasizes one method, which is memorization of isolated facts and concepts...but should also use a second method based on the theory that our minds organize pieces of related information into complex webs, called *schemata*. In this way, knowledge builds on itself, and the schemata grow exponentially. An integrated, thematic approach takes advantage of this process by having all the subjects revolve around a central theme, thus enabling students to develop complex webs of interconnected information.

There is a continuum of the way to teach thinking strategies. At one end are approaches that teach thinking explicitly in a content-free environment. At the other end are approaches that embed skills within the teaching of content. The former is commonly referred to as the *explicit* approach. The latter is called the *implicit* approach.

Robert J. Marzano (1992) states, "Barry Beyer is probably the most widely recognized proponent of the explicit approach. Beyer asserts that there are five steps to teaching a thinking strategy. First, the teacher introduces the strategy. During the second step, students would experiment with the strategy. The third step of Beyer's model has students reflecting on what goes on in their minds as they use the summarizing strategy and articulating their insights. This might be done in cooperative groups. As a result of the discussion, during the fourth step, students would make changes in the strategy. Finally, in the fifth step, students would try out the modified strategy and again reflect on its use. Beyer believes that, in general, students need the extensive and direct instruction provided by his model before they can use a thinking strategy independently."

Barry Beyer (1991) adds that researchers David Perkins and Gavriel Salomon reported thinking operations do not transfer easily from one subject or context to another, nor are students inclined to make such transfer unaided. Teaching thinking in a wide variety of subjects assists students in making the transfer needed to generalize their thinking.

Perkins and Salomon assert thinking and subject matter are, in fact, inextricably interwoven. Subject matter serves as a vehicle for thinking and for learning to think better. Thinking and thinking skills are tools for learning and understanding subject matter. Perkins and Salomon believe that incorporating the approaches of teaching of thinking in all subjects of a school curriculum will enable students to reap the benefits of better academic achievement and develop the ability and willingness to think more effectively.

Research by Ed Lawton (1993) speaks to the traditional focus of school programs. He feels the focus has been, and continues to be, on the cognitive learning domain. However, intellectual development depends on varying degrees of interaction with physical, psychological, and emotional factors. He states, "Therefore, a more distinct emphasis on all three domains may be important for effective instruction."

Insight of cognitive development may be obtained through research of Piaget's stages. Based on this stage theory, students between the ages of eleven and adulthood pass into the formal stage in which abstract thinking and ability to interpret symbolic language are expected. As is true of other stages, however, passage from

one level to another is uneven and gradual.

According to Slavin (1986), youngsters "often use cognitive behavior characteristic of two stages of development at the same time. As individuals advance from one stage to the next, the characteristics of the previous stage are maintained as the cognitive behaviors of the higher stage develop."

Lawton (1993) believed that at age 13, twenty percent, and at age 14, twenty-four percent of youngsters have moved into the formal operational period at both the onset and mature levels. This means that until age 14, some seventy-six percent of early adolescents continue to function in some part of the concrete operational stage. Brough (1989) supports this finding, indicating that seventy-five percent of middle level students display concrete rather than abstract reasoning abilities.

Early adolescence, then, is a phase-in period for the student moving from the concrete to the formal operational stage. Ed Lawton (1993) states, "For some, possibly twenty to thirty percent, it is a period in which abstract thought is already possible and should be encouraged."

Current curriculum and pedagogy fail to meet the learning needs and requirements of a population that has diverse learning styles and varied ability to conceptualize (Hodgkinson, 1985; Weiss, 1987; Mullis and Jenkins, 1988; Panel review of materials, June, 1989).

Another theory researched, called *cognitive learning theory*, or *constructivism*, proposes that students are active learners who constantly reconstruct their world view as they try to reconcile

past experiences and extend conceptual understanding with new experiences and information (Posner, et al., 1982; Driver, 1973, 1978; Anderson, 1987). This research supports the view that knowledge is a network of different concepts in the brain of the learner. Learners thus construct knowledge by making connections between new information and their existing conceptual framework (Peterson, Fennema, and Carpenter, 1988).

Researchers from the National Center for Improving Science Education (1990) state, "If the new information is consistent with a learner's existing conceptual framework, the learner can easily assimilate the new knowledge. However, if the new experience and information is sufficiently discrepant from the learner's conceptual framework, then a learner must accommodate the new information by actively reconstructing his or her framework" (p. 61).

Meaningful learning can occur when teachers present new ideas in familiar contexts; thus teacher planning and instructional technique should take student characteristics into consideration. Middle level teachers must remember that these students learn best when, "as problem solvers, they are most successful when faced with situations presented in concrete terms and with backup material that can be seen, touched, and manipulated (Van Hoose and Strahan, 1988).

Barry Beyer summarized classroom research by Barak Rosenshine and Saul Chapman, stating that it "demonstrated the value of specific techniques for providing skill-teaching techniques." The following techniques used across the curriculum help students to engage successfully in a thoughtful learning experience:

1. Modeling
2. Metacognitive reflection
3. Use of procedural checklists
4. Rehearsal
5. Use of graphic organizers
6. Cueing
7. Labeling

Research consistently shows that differences in middle level students' intellectual development require flexibility in instructional techniques, variety in teaching methods, student activities, grouping practices, and assessment procedures. Appealing to student imagination, stressing the value of an activity, and connecting lessons and other subjects are all valuable strategies in motivating and helping sustain student interest.

The NASSP Council on Secondary Education (1985) concludes that middle level educators must break away from the idea that middle level education programs should concentrate on preparing students for high school by providing programs that modify high school content and procedures. Curriculum for early adolescents must include programs that focus on the learning needs of students.

Middle level programs must also promote lifelong learning among students by providing appropriate educational expectations and options. In examining middle level education's responsibility to deal with the intellectual development needs of students (Toepfer,

et al., 1989), the National Association of Secondary School Principals (1989) recommended:

> *Instead of trying to force the masses of early adolescents to higher-level thinking, ready or not, perhaps we should help each student become the best thinker she or he can be at the rate and pace that her or his capacities and developmental readiness will allow. Such an approach will help ensure a better attitude toward learning and prepare youth for a long-term learning effort that extends far beyond the middle grades.*

Beane's research (1990) supports the premise that promoting such learning experiences requires middle level educators to address these three concerns:

*First, we must overcome the artificial divisions into which middle level curriculum has been traditionally organized.

*Second, teachers from various content areas must be repositioned together to facilitate thematic study.

*Third, middle level schools must organize so groups of students and teachers can work together beyond

a single school year.

He concludes that, "The middle level curriculum must interweave academic and non-academic concerns. Teachers from all content and skill backgrounds must be freed from the limiting mindset of preconceived, artificial separations of information and skill areas to pursue their professional responsibilities of planning and facilitating effective learning."

Summary

The review of research and literature in chapter two would seem to indicate the following:

1. Interdisciplinary curriculum and teaching offer learning opportunities for students at different developmental levels and with varying abilities.
2. Schools that use this approach to help students see connections across content areas are most successful when teachers are flexible and use teamwork.
3. Teaching strategies that promote and support integration of core curriculum subjects should be encouraged so we can combine and reduce the quantity of information we have to teach.
4. Integrated curriculum is more akin to real-life

experiences.

5. The mind makes meaning when it sees patterns and relationships and better retains information that is placed in a large context or frame.
6. Teachers who see the commonality among parts of the curriculum better understand the interrelatedness of the curriculum and gain payoffs in both instructional coordination and a maximum use of district resources.

CHAPTER III

PROCEDURES OF THE PROJECT

Introduction

The purpose of this project was to design a middle school teachers' manual to aid in the development of core integrated curriculum units. To accomplish this purpose, a review of current literature on integrated/interdisciplinary curriculum, and on learning and thinking patterns, was undertaken. Additionally, materials on selected, existing integrated interdisciplinary middle school programs were also reviewed.

Chapter III contains background information describing:

1. Need for the project.
2. Development and support for the project.
3. Procedures.
4. Planned implementation of the project.

Need for the Project

The researcher is a school librarian in Auburn, Washington, employed in a school that is presently in transition from a junior high

school (grades seven, eight, and nine) to a middle school (grades six, seven, and eight). In the fall of 1995 the transition of Olympic Junior High to a middle school model began.

Junior high school teachers were accustomed to working in an independent and departmentalized setting similar to that of a high school. Now they were being asked to team with other teachers and work in blocked periods of time along with opportunities for team and individual planning periods. These changes obviously impacted curriculum and presented opportunities for teachers to plan integrated units. It was evident that help was needed for the teachers to accomplish this task.

Development and Support for the Project

During the year before the transition to a middle school model for grades six, seven, and eight, I engaged in site visits, conferences, workshops, and graduate classes addressing current and innovative curriculum. As a librarian with twenty years' experience I have seen the need to design a more connected and relevant curriculum.

I began discussing plans for development of the integrated curriculum with the principal, as well as the secondary curriculum coordinator of the Auburn district, a curriculum consultant, and the superintendent of secondary curriculum. Members of the Washington State Instructional Model Committee and Student Learning Improvement Grant Committee encouraged and supported the idea of developing an integrated curriculum for students (in the

sixth, seventh, and eighth grades) in the core curriculum. Input from these individuals influenced my decision to proceed with the development of a manual to help teachers integrate their content.

Further encouragement to pursue the development of the manual came from reading *Raising Standards: A Guide to Essential Learnings for Washington Students*, March, 1995, produced by the Commission on Student Learning. It stresses the need to bring relevant and useful education reform strategies into the classroom and that we must be challenged to change and give the process a chance to work.

The proposed essential learnings are broad and are intended to serve as guideposts that encourage teachers to be flexible in designing curriculum and teaching strategies. The essential learnings stress a variety of ways and settings and an array of skills necessary for students to "organize and integrate relevant information" (p. 49), the next step in the process being to develop authentic assessment.

Procedures

An Educational Resources Information Center (ERIC) search was taken to obtain background information that was essential for developing integrated curriculum and the manual. Additionally, a hand search of other resources was conducted, involving teachers, consultants, the Auburn School District, and the National Association for Secondary School Principals.

Materials from existing integrated curriculum programs from

the Auburn district and throughout Washington State were obtained and analyzed. The planning and development of materials for the inservice manual were then undertaken.

Planned Implementation of the Project

The middle school teachers' manual was designed to aid in the development of integrated core curriculum units for middle level grades. It was intended for use at Olympic Middle School in the Auburn School District during the 1995-1996 school year.

Core subject teachers of grades six, seven, and eight used the manual to design integrated core curriculum units. Scheduled weekly visits to the library over a period of eight weeks was organized to assist the core teachers in the use of the manual and the development of the integrated units. On-line printed and nonprinted resources were also provided along with information and materials from existing integrated programs.

Attempts to integrate the curriculum took many forms, including:

*Resequencing topics;
*Reaching consensus on on curriculum plans;
*Establishing criteria for testing and grading;
*Determining subject matter connections;
*Developing new content resources and instructional materials;
*Planning lessons that use nontraditional approaches;

*Correlating content; and

*Developing thematic units in which subject areas are blended into a common theme.

Problems and concerns were dealt with as a whole rather than divided into knowledge fields. Teachers were more concerned with helping students deal with central concepts and values than with the equal distribution of time among the subject areas.

Special effort was also made to share the developed units with other teachers, administrators, and parents. A curriculum fair was held to showcase the units of student work. Evaluation instruments for the integrated units were completed by the students and teachers. Development of the units is an ongoing process. Feedback and recommendations were taken into consideration for improving existing units and developing new integrated units.

CHAPTER IV

THE PROJECT

The purpose of the project was to design a manual for middle-school teachers to aid in the development of core-integrated curriculum units. The manual will serve as an ally to the knowledge in textbooks, technology bases, and other available printed and nonprinted library and classroom resources. It will illustrate specific ways to integrate core curriculum knowledge and activities.

The manual is intended for use by school-based subject core teachers by providing a common field of knowledge on the development of integrated curriculum units for middle-level grades. The manual will enable educators to develop integrated core curriculum units that utilize themes and knowledge from a variety of resources, including current textbooks and printed and nonprinted library resources. Teachers will be encouraged to tie this knowledge in to community resources and to intentionally and contextually restructure teaching and learning.

The activities and materials designed and incorporated in the manual are presented in P1-P47.

A MANUAL
TO AID CORE TEACHERS
IN THE DEVELOPMENT OF
INTEGRATED CURRICULAR UNITS
FOR SIXTH, SEVENTH, AND EIGHTH-GRADE
STUDENTS
AT
OLYMPIC MIDDLE SCHOOL
IN
AUBURN, WASHINGTON

Irene M. Moren,

Librarian

Table of Contents

What is an Interdisciplinary Unit?

The interdisciplinary approach is a way of organizing the school in terms of curriculum, instruction, and resources, both human and material.

Disciplines do not lose their integrity through a team approach. Rather, the interdisciplinary approach clearly demonstrates the uniqueness of each discipline's contribution to the solution of problems.

The interdisciplinary approach is compatible with team teaching, individualization of learning, nongradedness, and flexible scheduling.

The interdisciplinary approach is ideally suited to the middle school student because it provides many and varied opportunities for success, exploration, and growth.

All disciplines need not combine for all interdisciplinary teaming. Teachers of complimentary skills may combine. Moreover, there are areas of instruction which may best be taught in the discipline to which they belong.

-- Jon Wiles and Joseph Bondi

The manual is designed to aid core teachers in the development of integrated curriculum units for 6, 7, and 8 grade students at Olympic Middle School in Auburn, Washington.

Step 1: Review what is currently being taught per grade level.

Step 2: Review definition, strategies, and rationale for integration.

Step 3: Provide an overview and application of academic standards and benchmarks from *A Guide to Essential Learnings for Washington Students.*

Step 4: Establish and organize content, essential learnings, and student outcomes, using curriculum maps.

Step 5: Use graphic organizers that serve as a visual cue to remind students of the application of particular content.

Step 6: Develop one integrated thematic, content-based unit per grade level that includes objectives, instructional strategies, assignments, assessments, and evaluation.

Definitions of *Integrated Curriculum*:

A curriculum that continuously encourages students to create bridges of their own between facts and learning (Connelly and Clandinin, 1988).

A theme approach that allows students and teachers a focus and a rubric for making decisions and meaningful connections across content or skills (Lipson, et. al., 1993).

A curriculum rooted in a view of learning as the continuous integration of new knowledge and experience so as to deepen and broaden our understanding of ourselves and our world (Beane, 1995).

Integration:
To form into a whole; to unite.
To incorporate into a larger unit.
To end the segregation of and bring into
common and equal membership (Webster, 1996).

Rationale for Integrated Curriculum

* The real world is integrated, not fragmented or compartmentalized.

* The mind better retains and readily recalls knowledge that is patterned and holistic.

* Integrated curriculum is more akin to real-life experiences.

* Integrated curriculum helps save time by helping us combine and reduce the quantity of information we have to teach.

* The mind better retains information from a large context or frame.

-- Glathorn, 1994

Building an Information Base About Interdisciplinary Curriculum

The following are activities that will assist you in exploring interdisciplinary curriculum development:

1. Read articles on the rationale, issues, advantages, and organization of the interdisciplinary curriculum (see attached *References* for appropriate articles).

2. Read books describing interdisciplinary curriculum development (see librarian for a list of library references in the professional section of the Olympic Middle School Library).

3. Attend local, state, regional, and national middle-level conferences/workshops with consultants who specialize in interdisciplinary curriculum, network with teachers who have developed curriculum units, and view media presentations (see options in Puget Sound Educational Resources catalogs).

4. Visit other middle-level schools that are having success with interdisciplinary curriculum organization.

Step 1: **Choose a theme for your grade level unit.**

Facilitate connections to help organize and build structure. Brainstorm, share, and articulate curriculum applications. Facilitate connections to help organize and build structure.

Help in Choosing a Theme

Clark and Clark (1995) state that "selecting a theme that is of interest to both students and teachers is an important factor in developing a successful interdisciplinary unit. A theme should be broad enough to have many natural connections across content areas" (p. 20).

Beane (1990) identifies themes that emerge from "the intersection of personal and social concerns and include:

TRANSITIONS
INTERDEPENDENCE
WELLNESS
INDEPENDENCE
CONFLICT RESOLUTION
COMMERCIALISM
JUSTICE
CARING
(p.20).

Brainstorm, Share, and Articulate Curriculum Applications

The planning cycle that Wiles, Bondi, and Associates (1986) suggest is the following:

Select a Theme

* Brainstorm possible themes for your unit.
* Look for a theme that relates to a district/school/team goal.
* You may wish to survey your students' interests before you begin brainstorming -- or you might want to suggest several possible themes and have your students vote for the one that appeals to them.
* Define (expand or narrow) the theme so that it:
  a. Includes district and state requirements.
  b. Can be mastered by your students in the time that you will schedule for it.
  c. Fits within the time that you allot to it.
  d. Is worth the time that you will put into it.
* It might be desirable to appoint one teacher on your team to be the leader for the development and implementation of the unit.

Brainstorm Examples

The inspiration for an interdisciplinary unit can come from a current event, a school or team goal, a current curriculum focus, a passage from a textbook, an understanding for the characteristics and the needs of early adolescence, or any number of ideas or comments expressed by a teacher or a student. The realm of possibilities is endless and limited only by your imagination. Some possible themes might include the following:

ENERGY

PROTECT-A-KID

LIVING IN A BILINGUAL SOCIETY

THE ENVIRONMENT

TOURISM

THE LAW AND YOU

HELPING OTHERS

ANTHROPOLOGY

MY COMMUNITY

AMERICA IS OKAY

PARENTS ARE PEOPLE TOO!

HEALTH, HYGIENE, AND GROOMING

CATASTROPHES AND NATURAL DISASTERS

PATTERNS

THE FUTURE

GENETIC ENGINEERING

CAREERS

AGGRESSION

DRUG ABUSE

CONSUMER ECONOMICS

SPACE EXPLORATION

CONTROLLED GROWTH/LIMITED RESOURCES

CITIZENSHIP

CONFLICT

(p. 10).

Source: Wiles and Bondi, *The Essential Middle School*; (1986) WBA, Inc., 213 Park Ridge, Tampa, FL 33617

Step 2: **Select a common time period to teach the unit.**

Step 3: **Define student outcomes.**

Work Independently

* Develop topics that can be addressed within your individual subjects that relate to the theme that you
* Develop a minimum of two objectives for your subject area topic.
* Identify skills that your subject can address within the topic.
* Think of specific activities that you might like to use. These activities should not be set in concrete but should ultimately be planned jointly with the team.

Meet Together/Define Objectives for the Unit

* Exchange and discuss each of your topics, objectives, and skills areas.
* Combine each subject area and objectives into a manageable package for your unit.
* Be flexible. Your activities may not exactly match your course description. Remember, you are enhancing your stated curriculum.

Meet Together/Select Activities

* Include activities from all three levels of intellect (see page P14).
* Provide students options within the unit.

* Have a certain number of required activities combined with optional ones. Students are expected to select an established number of each.
* Include open-ended and exploratory activities that extend the students' thinking.

Remember to Include Activities from All Three Levels of Intellect	
Output	
Evaluate	If/Then
Generalize	Apply a Principle
Imagine	Hypothesize
Judge	Forecast
Predict	Idealize
Speculate	
Process	
Compare	Infer
Contrast	Sequence
Classify	Analyze
Sort	Synthesize
Distinguish	Make Analogies
Explain (Why)	Reason
Input	
Complete	Match
Count	Name
Define	Observe
Describe	Recite
Identify	Select
List	Scan

Brainstorm Resources and Associations

Survey students, other teachers, and parents for resources. Additional resources may include:

* Media specialist
* Electives teachers
* Physical education teachers
* Occupational specialist
* Guidance counselors
* Guest speakers
* State archival/museum traveling collections
* Films/filmstrips/tapes
* Field trips
* Reference books
* Commercial kits
* Learning center ideas
* Community service agencies
* Parents
* PTA
* Students

Develop Activities (Independently and Collectively) Using a Curriculum Map

* Determine the availability of resources needed.
* Prepare printed and nonprinted materials/resources and bibliographies.
* Order materials if necessary.
* Contact resource material.
* Divide tasks between team members
* Review the curriculum mapping information and graphic organizers included in the manual.
* Write out the instructional process, identifying strategies, activities, and experiences to be used.

Curriculum Mapping

An overview of your integrated program design including:

* Organizing theme.
* Major content units or topics.
* District thinkings skills strand.
* State essential learnings.
* Content integration (i.e., art, music, math, technology, other.
* Skill integration and specific teaching strategies per subject (i.e., social skills, content skills, information processing skills, critical thinking skills, creative thinking skills, life skills, levels of intellect).
* Assignments.
* Culminating activities.
* Key resources.
* Time frame.

Purpose

A tool:

* To help move from a content-based to an integrated curriculum;
* To create a plan for what aspects of content will be integrated over the course of the unit;

* To facilitate prioritizing essential content learnings that match a theme;
* To ensure that "required" content is presented;
* To facilitate reorganizing content around themes, district thinking skills, and state essential learning goals, and levels of intellect.
* To inventory students' needs and interests to be met in the unit;
* To find many possible subject connections with the theme.
* To devise teching techniques appropriate for conceptual learning, working independently and in groups.

CURRICULUM MAP EXAMPLES

Unit Title:	Grade Level:	Quarter:
Programs Involved:	# Days:	
1. What is the primary purpose or reason for teaching this unit?		
2. How is this theme related to the learners': (a) Needs? (b)Interests?		
3. What basic organizing questions will guide the learners' work? How will students help generate these questions?		

Jon Wiles and Joseph Bondi (1993)

Curriculum Mapping Format					
Grade Level:			Subject:		
Time Period: Theme:		Big Question:	Teachers:		
Content	Concepts	General Skills	Specific Skills/ Objectives/ Essential Learnings	Resources Texts/ Materials	Evaluation/ Assessment

Jon Wiles and Joseph Bondi (1993)

Instructional Process

	Activities	Grouping/Time Arrangements	Responsibilities	Materials/Resources

Jon Wiles and Joseph Bondi (1993)

Theme/Focus

UNIT PLANS FOR GRADE			

PLANNING FORM EXAMPLES

A Planning Form for Students and Teachers:
BRAINSTORM

This form is suggested to help you in writing your detailed plans with your team. It may help you to complete the form before you work on the curriculum map.

I. Subject areas involved in integrated project:

II. Determine a unifying or organizing theme.
Title of Unit/Theme:

III. Determine the duration of the interdisciplinary curriculum experience.
Proposed Time:

IV. Develop a guiding question that relates to the unifying or organizing theme. What is the "Big Question" for students? This question helps focus students during the integrated unit.

V. Compare concepts and skills to be taught in each content area with state and district requirements. Identify strategies,

activities, and experiences to be used in instruction.

Overall Objectives for Each Subject Area:

A. Math

Objectives:

B. Language Arts/Reading

Objectives/Essential Learnings:

C. Science

Objectives/Essential Learnings:

D. History

Objectives/Essential Learnings:

E. PE/Electives

Objectives/Essential Learnings:

VI. Determine tasks that must be completed to facilitate planning and implementation, and assign specific responsibilities to each member of the planning/teaching team.

VII. Introductory and culminating activities (letter to parents, student input, etc.).

VIII. Assessment (objective tests, rubrics and scoring guides, interviews, portfolios, anecdotal records, parent conferences, etc.)

IX. Evaluation (both teacher/resource person and student):

X. Determine the availability of resources needed. Materials (books, films, resource people, library, print/nonprint resources, technology, etc.):

GRAPHIC ORGANIZERS EXAMPLES

Parks, Sandra & Howard Black (1992) *Book I: Organizing Thinking*;
Pacific Grove, CA. Critical Thinking Press & Software.
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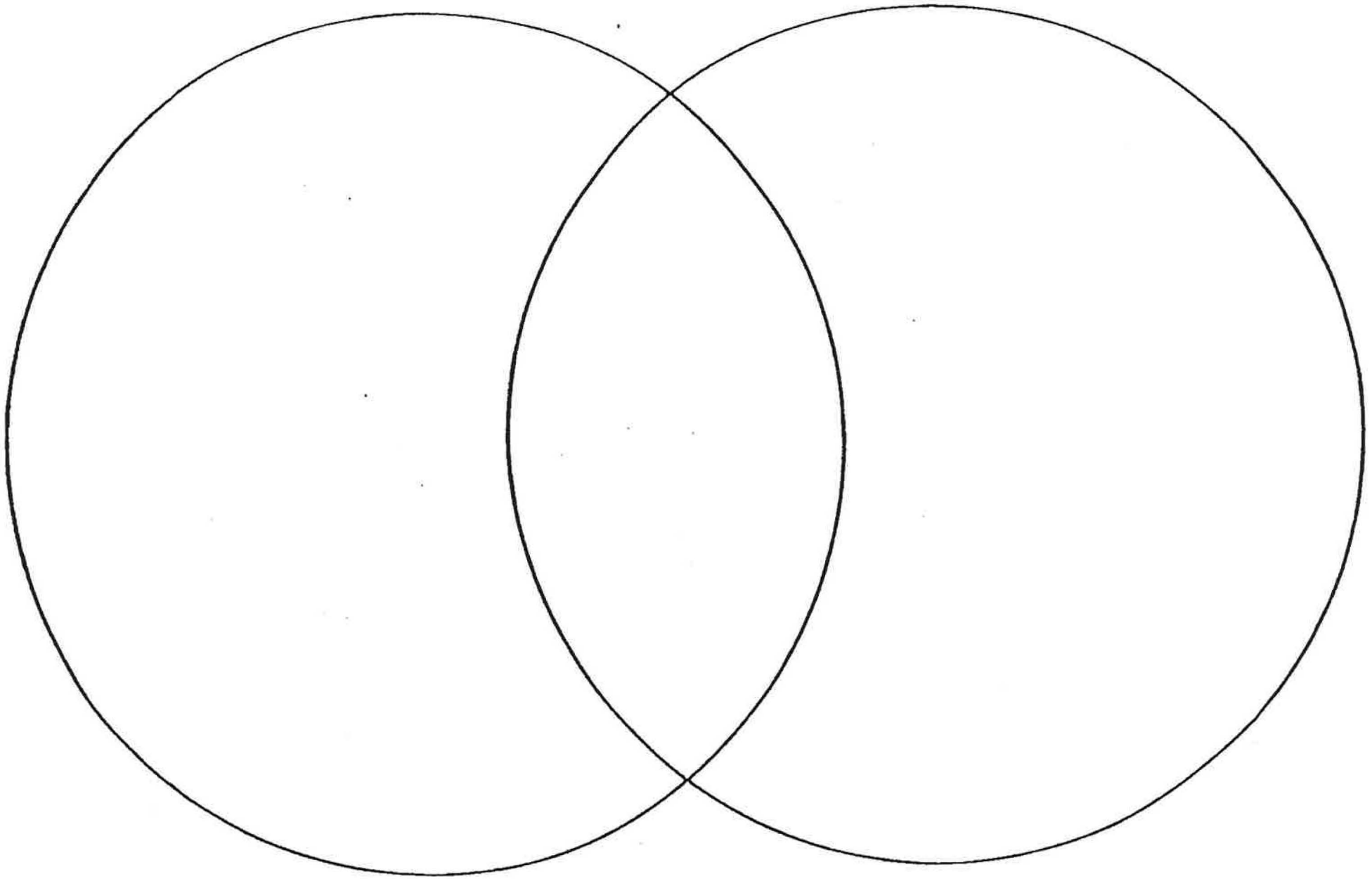
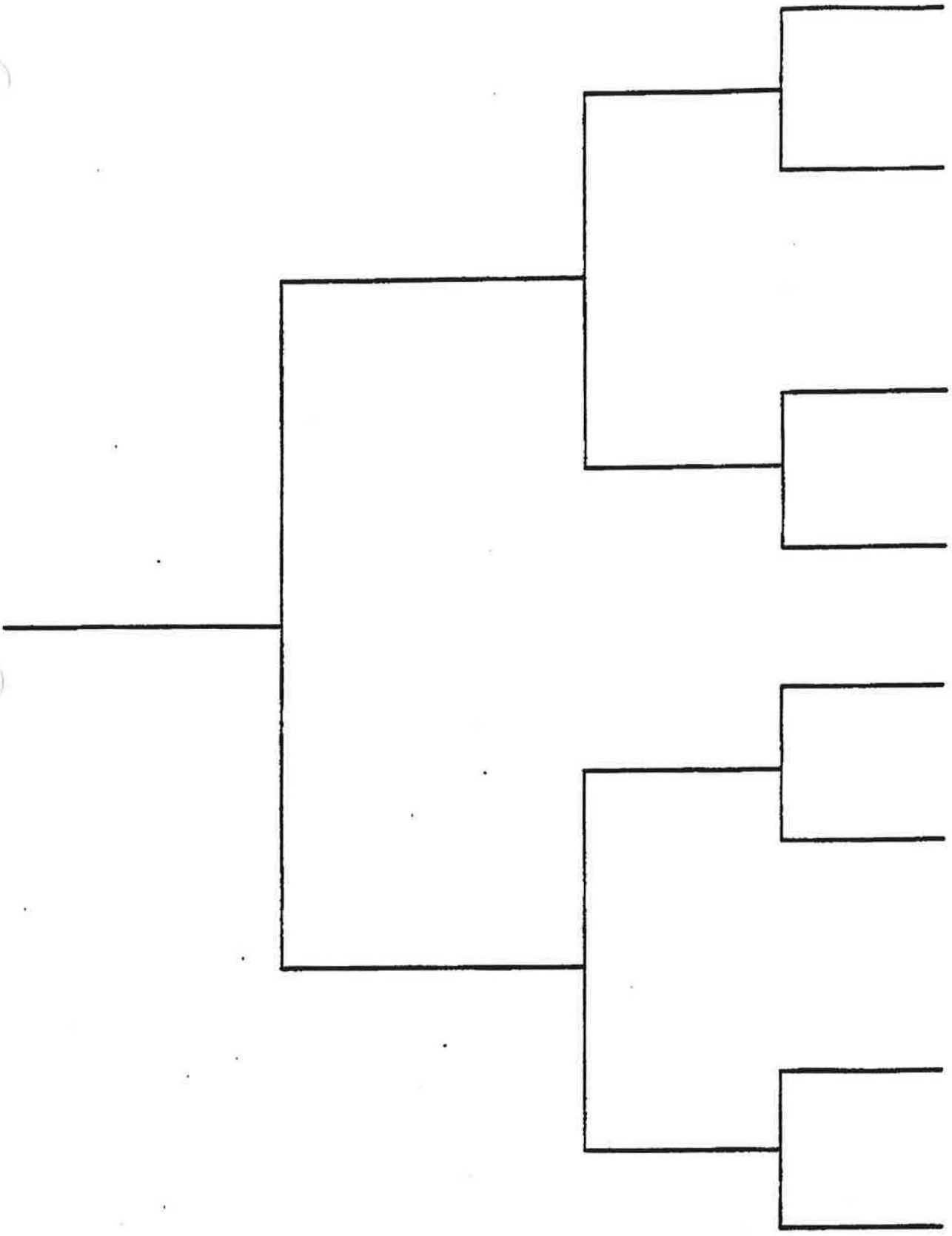
Pacific Grove, CA. Critical Thinking Press & Software.



Comparing/Contrasting



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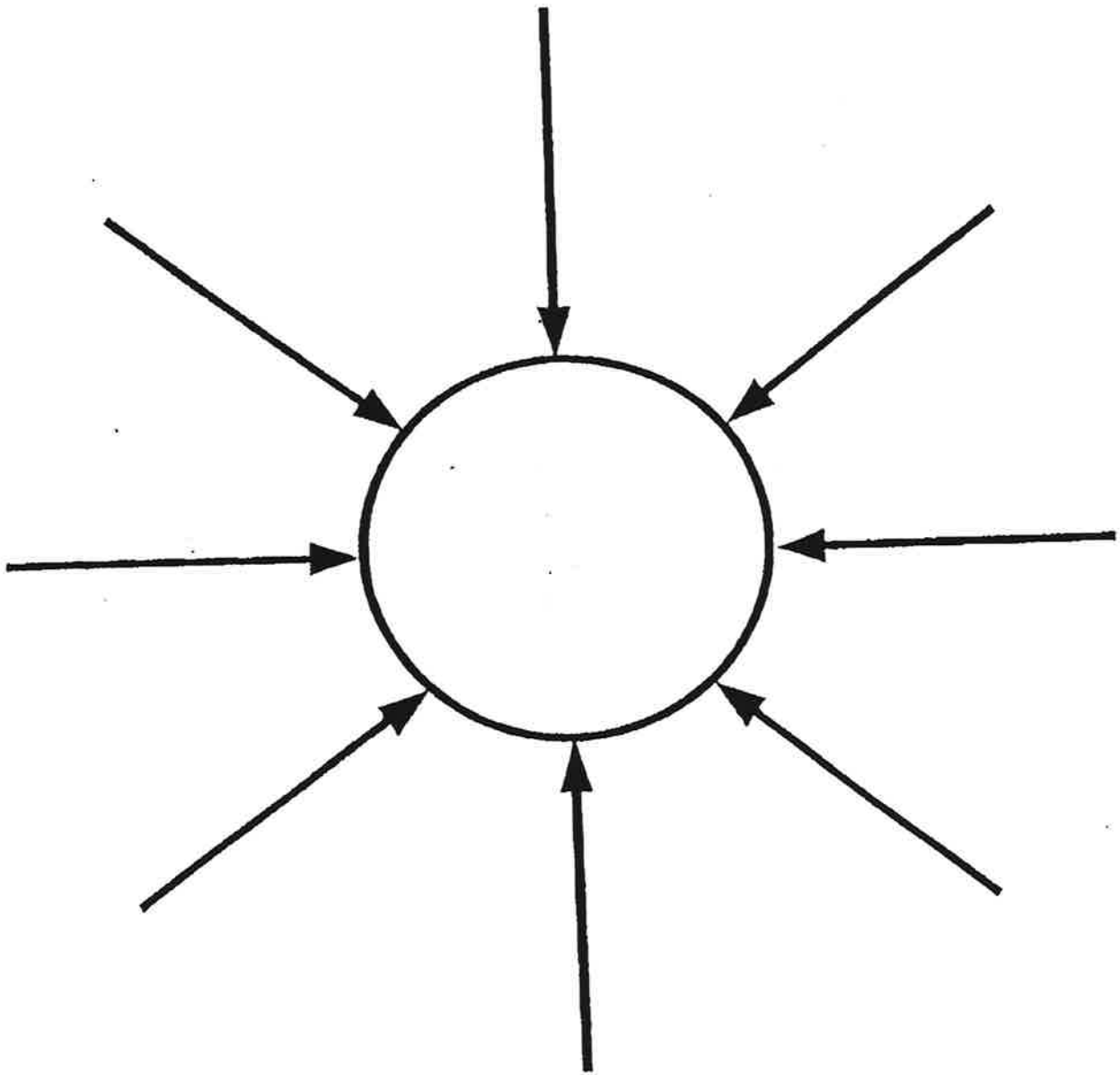

Ask the "Big Question"/Guiding Question

* How can my subject fit into this unit or theme?
* Are my students' needs being met in this unit?
* Construct a question that directs the unit.

Conclusions

There are two major benefits to the curriculum mapping process, which connects goals and objectives to programs. First, by viewing the intentions for students in totality, school planners can often identify redundancy in both the scope (breadth) and the sequence (order) of the general curriculum. Second, such an overview can help planners see commonality among parts of the curriculum. Understanding the interrelatedness of the curriculum can have payoffs in both instructional and in a maximum use of district resources (p. 108).

-- Wiles and Bondi (1989)

Step 4: **Plan and write your class unit.**

* Create a student activity to introduce the question and begin the unit.
* Activity should cultivate thought on theme and/or question.

Step 5: **Review and Delineate:**

* Specific teaching strategies,
* Essential content,
* Designated essential learning goal,
* Thinking skill,
* Sequences,
* Materials,
* Assignments.

Student Learning Goals

* *Read* with comprehension, write with skill, and communicate effectively and responsibly in a variety of ways and settings.

* *Know* and apply the core concepts and principles of mathematics; social, physical, and life sciences; civics and history; geography; arts; and health and fitness.

* *Think* analytically, logically, and creatively, and to integrate experience and knowledge to form reasoned judgments and solve problems.

* *Understand* the importance of work and how performance, effort, and decisions directly affect future career and educational opportunities.

THINKING SKILLS OR PROCESSES

Information Processing Skills

Observation	Inferring
Comparing	Finding Evidence
Classifying	Predicting
Patterning	Evaluating
Sequencing	Analyzing
Summarizing	Synthesizing
Main Idea	

Critical Thinking Skills

Credibility of a Source	Point of View
Relevance/Irrelevance	Fact/Opinion
Unstated Assumptions	Detecting Bias

Creative Thinking Skills

Fluency	Flexibility
Originality	Elaboration

Life Skills

Goal Setting

Decision Making

Problem Solving

AUBURN SCHOOL DISTRICT
THINKING SKILLS SCOPE AND SEQUENCE

	K	1	2	3	4	5	6	7	8	9	10	11	12
INFORMATION PROCESSING SKILLS	Observing Comparing Classifying			Patterning Sequencing Main Idea		Finding Evidence Predicting		Evaluation And continued development of K-6 skills		Analysis		Synthesis	
CRITICAL THINKING SKILLS								Credibility of Source, Detecting Bias, Point of View, Relevance/Irrelevance, Identifying Unstated Assumptions, Determining the Strength of an Argument					
MACRO-THINKING SKILLS	Goal Setting			Problem Solving		Decision Making		Goal Setting, Problem Solving, Decision Making					
CREATIVE THINKING SKILLS	← Fluency, Flexibility, Originality, Elaboration →												

Step 6: **Schedule the unit.**

* Place activities and events on a calendar.
* Reserve the library, stage, gymnasium, and classroom for activities.
* Schedule guest speakers.
* Schedule field trips.
* Schedule a curriculum fair/open house as an evening showcase for projects
* Contact the PTA for assistance.

Step 7: **Advertise the unit.**

* Get students excited about the unit.
* Decorate bulletin boards with "Coming Attractions."
* Send letters home explaining the theme and objectives of the unit. This is a networking opportunity for prior permission for field trips, resource persons, solicitation of chaperones, etc.
* Wear slogans on your lapel that relate to the upcoming unit.
* Advertise over the public address system.
* Place advertisements in the PTA newsletter, the team newsletter, the principal's newsletter.

Step 8: **Implement/teach the unit.**

* Have fun with the unit.
* Flexibility is the key to the unit's success.
* Take notes that will help the unit "evolve."
* What did the students enjoy the most?
* What materials were still needed?
* Were any guest speakers exceptional?
* How could the unit be improved/streamlined for future use?
* Which activities should be deleted?
* Maintain a resource file.
* Share this information with other teachers.

Step 9: **Share your unit.**

Select a mutual time to share projects with:

* Staff
* Families
* Community members
* District personnel

Select a public event to display projects:

* An evening event such as a curriculum fair/open house.
* Staff meetings
* Team meetings
* Board meetings.

Be visual.

* Staff enjoy seeing the rewards and successes of peers and students.
* Brag.
* Identify each subject area/team member/student contribution.
* Label exhibits.

Step 10: <u>Evaluate the unit.</u>

* Teacher/Resource Person
* Student Evaluation

Teacher/Resource Person Evaluation Sheet

1. Have you actively participated with your team in order to understand the meaning of interdisciplinary instruction?

2. Has your team actively participated in discussions of each aspect of writing interdisciplinary units?

3. Has your team identified the characteristics of good plans for an interdisciplinary unit?

4. Have you and your teammates worked together to write unit plans acceptable to all team members?

5. Have you made plans to share your interdisciplinary unit with other staff members, parents, etc.?

6. Has your team identified the ways of evaluating the products of your efforts?

7. Suggest two ways to improve/streamline this unit for future use.

Interdisciplinary Unit Student Evaluation

1. What did you like best about working on your project?

2. Name two facts your learned about _____(theme).
   a.

   b.

3. What did you like least about studying _____(theme)?

4. Name three ways to make this unit better.
   a.

   b.

   c.

5. What did you like best about the Curriculum Fair/Open House?

6. What would make Curriculum Fair/Open House better for next year?

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CHAPTER V

SUMMARY AND RECOMMENDATIONS

Summary

The purpose of the project was to develop a manual providing teachers of middle level students with techniques to integrate curriculum. The manual supplies teachers with a common framework, vocabulary, strategy, purpose, and assessment procedures. Using the manual, teachers from core subject interdisciplinary teams of grades six, seven, and eight developed, taught, and assessed a grade-level integrated thematic unit. The units were a minimum of two days in length and incorporated the following:

a. Thinking skills scope and sequence designated by Auburn School District;
b. Overview and application of academic standards and benchmarks from *A Guide to Essential Learning for Washington Students*, developed by the Commission on Student Learning; and
c. Middle school curriculum objectives and goals of science, math, language arts, and social studies developed by Auburn School District.

Conclusions

Conclusions as a result of the project were:

1. Three integrated instructional units, one per grade level team, were developed.
2. Each integrated unit was sufficiently developed to be taught and evaluated by teachers, resource persons, and students.
3. In the development of the integrated unit, teachers had to use a wider range of resources than they were previously accustomed to using; i.e., technological, reference books, community members, etc.
4. Working in teams afforded teachers an opportunity to communicate with other core teachers.
5. The interrelatedness of different core subject objectives became apparent to teachers as they designed and planned units together.

Recommendations

Progress is made in small steps. The next step will be to develop assessment tools to measure the students' growth over time.

Teachers should:

1. Be given instruction on the philosophy, goals, and objectives of the state, district, and school;
2. Select learnings worthy of teaching time and assessment time;
3. Be given further instruction on learning styles and how they influence instruction;
4. Develop themes that speak to students' curiosity;
5. Involve increased use of technology;
6. Instruct in a variety of modalities and styles, differentiated and developmental according to student needs;
7. Help parents understand how to help and participate in their child's intellectual development;
8. Be empowered to make curriculum and instructional decisions; and
9. Realize that subject matter integrity is not lost by including numerous examples of exploratory and discovery activities.

Like so many middle school materials, the manual and corresponding units can be altered and reconstituted. It is hoped that teachers will add, delete, translate, and otherwise adapt materials

developed to meet their individual needs and the specific needs of the middle school student.

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Appendix A

THREE INTEGRATED INSTRUCTIONAL UNITS

Grade 6

Grade 7

Grade 8

A Planning Form for Students and Teachers, *Grade 6*:
BRAINSTORM

This form is suggested to help you in writing your detailed plans with your team. It may help you to complete the form before you work on the curriculum map.

I. Subject areas involved in integrated project:
Reading, Math, Counselors, Art, Science, History.

II. Determine a unifying or organizing theme.
Title of Unit/Theme:
Patterns

III. Determine the duration of the interdisciplinary curriculum experience.
Proposed Time:
Eight Weeks.

IV. Develop a guiding question that relates to the unifying or organizing theme. What is the "Big Question" for students? This question helps focus students during the integrated unit.
How do patterns affect your lives?

V. Compare concepts and skills to be taught in each content area with state and district requirements. Identify strategies, activities, and experiences to be used in instruction.

Overall Objectives for Each Subject Area:

A. Math

Objectives:

Students will know and apply the Fibonacci number series and will recognize the 3,5,8,13,21 pattern in nature., i.e., beehive, spider web, crystals.

Students will compare basic geometric shapes to those basic shapes in nature.

Students will compare structures in strength; i.e., bridge bulding, the zen of structure.

Students will compare different kinds of architecture, using pictures. Students will pick out basic geometric shapes in the following books: *Pyramid*, *Houses* (roof types), and *Unbuilding*.

Essential Learnings:

Know and apply the core concepts and principles of mathematics; social, physical, and life sciences; civics and history; geography; arts; and health fitness. Mathematics can be used to solve life's practical problems and complex puzzles. The mathematical sciences require and support the development of thinking skills. Strategies will be developed

that allow subject content to be taught among curricular areas so that students will:

a. Apply and connect thinking and modeling of the mathematical sciences to other disciplines and real-life situations.

b. Lessons will be developed that use a mode of inquiry so students will logically and creatively employ observation, simulation, and experimentation as a means of challenging and extending their current understanding.

B. Language Arts/Reading

Objectives:

The student will study that the form created was dictated by the function -- all architecture has purpose. Mankind has had basic needs, and these have, in part, been met by architecture.

The student will manipulate basic shapes and forms and note similarities in all structures.

The student will determine that the shapes and forms of architecture have not changed over time.

The student will discover that different structures have different purposes and different strengths. He will research the following patterns in nature:

Life in the sea.

The student will complete a nine-week reading unit entitled, "Challenge of the Sea."

The student will read about famous structures and famous architects.

The student will read about styles of architecture.

The student will define and apply architectural terms (i.e., cornice, post, base, column, pediment).

Essential Learnings:

Read with comprehension, *write* with skill, and *communicate* effectively and responsibly in a variety of ways and settings.

Reading requires and supports the development of thinking skills. Strategies will be developed that allow reading to be taught among subject areas so that students will construct meaning from a variety of integrated resources.

Writing requires and supports the development of thinking skills. Strategies will be developed by the grade-six team so writing is taught among the subject areas as to process of discovery that connects students to work, to culture, to society, and to existing knowledge.

C. Science

Objectives:

Students will come to appreciate their fellow students as co-inquirers and fellow learners.

Students will build bridges, using toothpicks.

Students will test bridges for stress components and weight capacity.

Students will construct a Roman arch, using blocks.

Students will find patterns in nature.

Students will construct architectural shapes and buildings, using magnets, stamps, straws, and blocks.

Students will take an architectural term such as any of the column types or flying buttress shapes and write a one-page report or make a model to demonstrate the concept to the class.

D. History

Objectives:

Students will match architectural structures to the following periods of history:

Early Architecture

Asian and Pre-Columbian Architecture

Classical Architecture

Medieval Architecture

Renaissance Architecture

Baroque Architecture

The 1700s Architecture

The 1800s Architecture

Modern Architecture

Students will appreciate architectural forms in their

surroundings.

Essential Learnings:

Think analytically, logically, and creatively, and integrate experience and knowledge to form reasoned judgments to solve problems.

Interpret and link conceptual and procedural understandings from among core concepts and principles of varied curricular areas.

Apply and connect thinking and modeling of the mathematical sciences to other disciplines and real-life situations.

Graphic organizers will be developed by faculty to serve as a visual cue to remind students of the thinking process and to transfer that process to a particular content application.

E. PE/Electives

Objectives/Essential Learnings:

Counselors will present a 45-minute lecture to each grade-six team of students on healthy patterns in living.

VI. Determine tasks that must be completed to facilitate planning and implementation, and assign specific responsibilities to each member of the planning/teaching team.

Involvement of all grade-six teachers and two counselors.

Interdisciplinary team members will:

Encourage differentiated and diversified learning activities and assignments.

Reference content from different fields of study.

Apply thinking skills and processes within and across the relevant subject areas.

Share ideas and develop new ones as they interact regularly with each other.

VII. Introductory and culminating activities (letter to parents, student input, etc.).

Teachers shared print images and visuals of architectural structures, using reference books, picture library, and CD-ROM.

Students cooperatively label parts of historical castles and color the images.

Parent conferences will be held at the curriculum fair.

Students displayed projects for curriculum fair/open house.

Parents were invited to attend curriculum fair.

VIII. Assessment (objective tests, rubrics and scoring guides, interviews, portfolios, anecdotal records, parent conferences, etc.)

Individual student portfolios

Objective tests

Student interviews

Student planning sheets

Parent conferences at curriculum fair

Written reports.

IX. Evaluation (both teacher/resource person and student):

Students rated members of their peer cooperative groups.

Students completed evaluation form.

Teachers completed evaluation form.

X. Determine the availability of resources needed. Materials (books, films, resource people, library, print/nonprint resources, technology, etc.):

Library technological resources to include Grolier Encyclopedia CD-ROM.

Folders on: architectural wonders of the world and architectural history (compiled by the librarian and team teachers).

Library prints and videos.

Periodical references -- searches completed from on-line resources.

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A Planning Form for Students and Teachers, Grade 7:

BRAINSTORM

This form is suggested to help you in writing your detailed plans with your team. It may help you to complete the form before you work on the curriculum map.

I. Subject areas involved in integrated project:

Language Arts, Social Studies, Science, Physical Education/Health

II. Determine a unifying or organizing theme.

Title of Unit/Theme:

The Olympic Games

III. Determine the duration of the interdisciplinary curriculum experience.

Proposed Time:

Four weeks

IV. Develop a guiding question that relates to the unifying or organizing theme. What is the "Big Question" for students? This question helps focus students during the integrated unit.

What makes a person physically fit?

V. Compare concepts and skills to be taught in each content area with state and district requirements. Identify strategies, activities, and experiences to be used in instruction.

Overall Objectives for Each Subject Area:

A. Math

Objectives:

The students will study the metric system to compare world records.

Essential Learnings:

Know and apply the core concepts and principles of mathematics; social, physical, and life sciences; civics and history; geography; arts; and health fitness.

B. Language Arts/Reading

Objectives/Essential Learnings:

Take the position and debate one of the following:

(a) Do you believe athletics plays an important part in forming a person's character?

(b) Do you believe that international sports competition promotes world peace?

Research the following:

The sites of the Olympic Games

The International Olympic Committee

Role of national committee

Selection of athletes

Judging of Olympic events

Medals

The ancient and modern games

Flags of world organizations

Hockey (amateur development)

Ice skating (figure skating, speed skating)

Marathon

Olympiad

Pentathlon

Skiing (as a sport)

Weightlifting

World countries that compete in the Olympic Games

Careers in health and science

Famous athletes

Essential Learnings:

Read with comprehension, write with skill, and communicate effectively and responsibly in a variety of ways and settings.

Reading requires and supports the development of thinking skills. Strategies will be developed that allow reading to be taught among subject areas so that students will construct meaning from a variety of integrated resources.

C. Science

Objectives:

Students will research one of the following:

Sports injuries (sprains, fractures, dislocations). Causes and locations of injury, treatment of injury, rehabilitation.

Personal fitness. Aerobic, cardiovascular, nutrition, body fat percentage, weight training, target heart rate, activities (biking, swimming, running, etc.)

Famous athletes (personal backgrounds, how they trained and overcame obstacles in their careers, accomplishments/where they are now, ends of their careers, advancements, etc.)

D. History

Objectives:

Students will choose one country that has participated in the Olympics and research the following:

Government

Resources

Architecture

Historical background

Economy

Geography

Climate

Plants and animals

Tourist trade

Culture (food, clothing, arts, traditions, religion, etc.)

Essential Learnings:

Think analytically, logically, and creatively, and integrate experience and knowledge to form reasoned judgments to solve problems.

Graphic organizers will be developed by faculty to serve as a visual cue to remind students of the thinking process and to transfer that process to a particular content application.

E. PE/Electives

Objectives/Essential Learnings:

Counselors will present a 45-minute lecture to each grade-eight team of students on good character/good sportsmanship.

VI. Determine tasks that must be completed to facilitate planning and implementation, and assign specific responsibilities to each member of the planning/teaching team.

Involvement of all grade-seven teachers and two counselors:

Encourage differentiated and diversified learning activities and assignments.

Reference content from different fields of study.

Apply thinking skills and processes within and across the relevant subject areas.

Share ideas and develop new ones as they interact regularly with each other.

VII. Introductory and culminating activities (letter to parents, student input, etc.).

Teachers shared print images and visuals of the Olympic Games, using reference books, picture library, and CD-ROM.

Students cooperatively label highlights of the Olympic Games.

Students displayed projects for curriculum fair/open house.

Parents were invited to attend curriculum fair.

Students will share their debate presentations, country projects, and papers with the students and parents during the curriculum fair.

VIII. Assessment (objective tests, rubrics and scoring guides, interviews, portfolios, anecdotal records, parent conferences, etc.)

Essay writing

Students will keep journals that discuss:

How athletes played an important part in the religious festivals of the ancient Greeks.

A comparison of ancient and modern Olympic Games.

Individual student portfolios

Objectives tests

Interview students

Students completed planning sheets

Country projects to include maps, tourist pamphlets, note cards, architecture, culture, historical time lines of country's history.

Parent conferences/discussions at curriculum fair.

IX. Evaluation (both teacher/resource person and student):

Students rated members of their peer cooperative groups.

Students completed evaluation form.

Teachers completed evaluation form.

X. Determine the availability of resources needed. Materials (books, films, resource people, library, print/nonprint resources, technology, etc.):

Library technological resources to include Grolier Encyclopedia CD-ROM.

Folders on: sports injuries, famous Olympic athletes, background of Olympic Games created by librarian/teachers.

Library print references.

Videos: Olympic Games, competition, and fitness.

Periodical references on Olympic Games.

A Planning Form for Students and Teachers, *Grade 8*: BRAINSTORM

This form is suggested to help you in writing your detailed plans with your team. It may help you to complete the form before you work on the curriculum map.

I. Subject areas involved in integrated project:

Language arts, U.S. history, math, science

II. Determine a unifying or organizing theme.

Title of Unit/Theme:

Civil War

III. Determine the duration of the interdisciplinary curriculum experience.

Proposed Time:

Four weeks

IV. Develop a guiding question that relates to the unifying or organizing theme. What are the "Big Questions" for students? These questions help focus students during the integrated unit.

1. What caused the Civil War?
2. What would it have been like to be a soldier in this war?

3. What do you think was the most important consequence of the war to the South?
4. What do you think was the most important consequence of the war to the North?

V. Compare concepts and skills to be taught in each content area with state and district requirements. Identify strategies, activities, and experiences to be used in instruction.

Overall Objectives for Each Subject Area:

A. Math

Objectives:

Students will cooperatively write word problems, using the theme *Civil War*.

Students will work to solve word problems.

Students will learn that in terms of human casualties, the Civil War cost more than any other American war.

Students will estimate the financial cost of the Civil War, including direct costs for the four years of fighting and indirect costs, such as pensions and interest on the national debt.

Students will estimate the financial cost of expenses borne by state and local governments, the property damages caused by the war, and the value of freed slaves.

Students will compare resources of the North and South.

Essential Learnings:

Know and apply the core concepts and principles of mathematics; social, physical, and life sciences; civics and history; geography; arts; and health fitness.

B. Language Arts/Reading

Objectives:

Students will research the causes and background, events, and Civil War battles.

Students will write a five-paragraph paper on one of the following:

(a) What were the three most significant causes of the Civil War?

(b) Take the position of a Northerner or a Southerner, and write a paper persuading others to support your cause (i.e., If a Northerner, "Why is it essential to keep the Union together?" If a Southerner, "Why is secession necessary?").

Synthesis: To pull together content from history into a coherent paper.

Essential Learnings:

Read with comprehension, *write* with skill, and *communicate* effectively and responsibly in a variety of ways and settings.

Reading requires and supports the development of thinking

skills. Strategies will be developed that allow reading to be taught among subject areas so that students will construct meaning from a variety of integrated resources.

C. Science

Objectives:

Students will research the medicine and sanitary conditions during the Civil War era.

D. History

Objectives:

Students will discuss why the Civil War is considered to be the first modern war.

a. Mines and rifled weapons
b. New techniques as telegraphy, photography, balloon observation
c. Breech-loading and repeating rifles
d. Trenches and wire entanglements
e. Role of railroads and ships

Students will discuss that the Civil War showed the importance of warfare that aims at the heart of a country, rather than at its army.

Students will discuss that the Civil War was a war of total objectives.

The North had to force the South back into the Union. The South wanted to force the North to recognize its

independence. Neither side could accept a compromise.

Students will study/analyze the events leading to the secession and war from both perspectives.

Students will examine battle techniques and strategies, comparing and contrasting them to revolution.

Students will research a battle and incorporate their findings into a personal letter or journal entry from the point of view of a soldier who was in the battle.

Students will read about war correspondents and recruiting volunteers.

Essential Learnings:

Think analytically, logically, and creatively, and integrate experience and knowledge to form reasoned judgments to solve problems.

Graphic organizers will be developed by faculty to serve as a visual cue to remind students of the thinking process and to transfer that process to a particular content application.

E. PE/Electives

Objectives/Essential Learnings:

Counselors will present a 45-minute lecture to each grade-eight team of students on conflict resolution.

VI. Determine tasks that must be completed to facilitate

planning and implementation, and assign specific responsibilities to each member of the planning/teaching team.

Involvement of all grade-eight teachers and two counselors.

Interdisciplinary team members will:

Encourage differentiated and diversified learning activities and assignments.

Reference content from different fields of study.

Apply thinking skills and processes within and across the relevant subject areas.

Share ideas and develop new ones as they interact regularly with each other.

VII. Introductory and culminating activities (letter to parents, student input, etc.).

Teachers shared print images and visuals for the Civil War era, using reference books, picture library, and CD-ROM.

Students cooperatively label highlights of the Civil War.

Students displayed projects for curriculum fair/open house.

Parents were invited to attend curriculum fair.

Students will share their letters and papers with the students and parents during the curriculum fair.

VIII. Assessment (objective tests, rubrics and scoring guides, interviews, portfolios, anecdotal records, parent conferences, etc.)

Essay writing

Students will keep journals that discuss:

- How the States Lined Up.
- Rallying 'Round the Flags.
- The Draft
- Military Leadership
- Johnny Reb and Billy Yank
- A Soldier Has a Hard Life
- Hospitals and Prisons
- Negroes in the Civil War
- The Emancipation Proclamation

Individual student portfolios

Objectives tests

Interview students

Students completed planning sheets

Letter, battle sheet, and bibliography

Parent conferences/discussions at curriculum fair

IX. Evaluation (both teacher/resource person and student):

Students rated members of their peer cooperative groups.

Students completed evaluation form.

Teachers completed evaluation form.

X. Determine the availability of resources needed. Materials (books, films, resource people, library, print/nonprint resources, technology, etc.):

Library technological resources to include Grolier Encyclopedia CD-ROM.

Battle folders created by librarian/teachers

Library print references

Videos: Civil War Journal series

PBS Civil War Series.