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What Is Integrated Curriculum?

Innovative educators concerned with improving student achievement are seeking ways to create rigorous, relevant, and engaging curriculum. They are asking questions such as these:

- Can making wind and rain machines improve the reading comprehension and writing scores of elementary students on the Florida Comprehensive Assessment Test?
- Do students really learn math by learning to clog dance?
- When students spend after-school time participating in a micro-society that reflects the roles of real life, will their test scores in math and reading improve?

In Florida, Okhee Lee, an education professor at the University of Miami, engages elementary students in making little wind and rain machines. Students focus on the “big ideas” such as evaporation, condensation, and thermal energy. The Florida Comprehensive Assessment Test (FCAT) does not test science; however, Lee’s students have shown more than 100 percent gains in comprehension and writing on the FCAT. Their success in language is particularly impressive because many of the students come from different ethnic backgrounds, and many of them speak English as their second language. Lee claims that when she teaches science concepts she also

teaches students to think and write in the structured, coherent ways required on standardized tests (Barry, 2001).

In public schools in Asheville and Buncombe, North Carolina, students learn math skills through clog dancing and explore the solar system through modern dance. In these schools, teachers deliver the core curriculum through the arts. This approach is based on the research report *Champions of Change: The Impact of the Arts on Learning* (Fiske, 1999). This report offers clear evidence that sustained involvement in particular art forms—music and theater—is highly correlated with success in mathematics and reading. Furthermore, at-risk students do particularly well both academically and personally in these types of programs (Blake, 2001).

Students participate in a micro-society in an after-school program at Amistad Academy in New Haven, Connecticut. This program prepares middle school students from a poor minority population for colleges, careers, and citizenship. They attend traditional classes during the regular school day, and after school for a few hours a week, they belong to a micro-society—holding jobs, paying taxes, running businesses, making laws, and punishing lawbreakers. The purpose of the program is to make school more relevant and fun while building transferable life skills. The school raised its average test scores two and a half levels in math and one and a half levels in reading. In 1998, a study of 15 micro-society schools in

six states found that at two-thirds of the schools, students posted gains on standardized reading and math tests that were as much as 21 percent greater than those of their peers (Wilgoren, 2001).

In these three examples, student achievement is a primary focus. Teachers maintain accountability while designing learning experiences that are relevant to student interests. Interestingly, two of the schools serve populations of diverse students. In each case, teachers have developed intriguing curriculum that pushes beyond the boundaries of traditional disciplines to produce positive results. Comprehension, for example, is comprehension, whether taught in a language class or a science class. When students are engaged in learning, whether they are taking part in the arts or role playing in a micro-society, they do well in seemingly unconnected academic arenas. These are only a few of the countless examples of students involved in interdisciplinary studies at all grade levels. The examples highlight the potential of integrated curriculum to act as a bridge to increased student achievement and engaging, relevant curriculum.

Defining Integrated Curriculum

What exactly is integrated curriculum? In its simplest conception, it is about making connections. What kind of connections? Across disciplines? To real life? Are the

connections skill-based or knowledge-based?

Defining integrated curriculum has been a topic of discussion since the turn of the 20th century. Over the last hundred years, theorists offered three basic categories for interdisciplinary work; they defined the categories similarly, although the categories often had different names. Integration seemed to be a matter of degree and method. For example, the National Council of Teachers of English (NCTE) offered the following definitions in 1935:

Correlation may be as slight as casual attention to related materials in other subject areas . . . a bit more intense when teachers plan it to make the materials of one subject interpret the problems or topics of another.

Fusion designates the combination of two subjects, usually under the same instructor or instructors.

Integration: the unification of all subjects and experiences.

We joined this conversation in the early '90s. At the time, we were unaware of the long history of educators with similar concerns. In our separate locations, we defined three approaches to integration—multidisciplinary, interdisciplinary, and transdisciplinary. Our definitions of these categories emerged from our personal experiences in the field. We noticed that people seemed to approach integrating curriculum from three fundamentally different starting points. In looking back, we see that our definitions closely aligned with

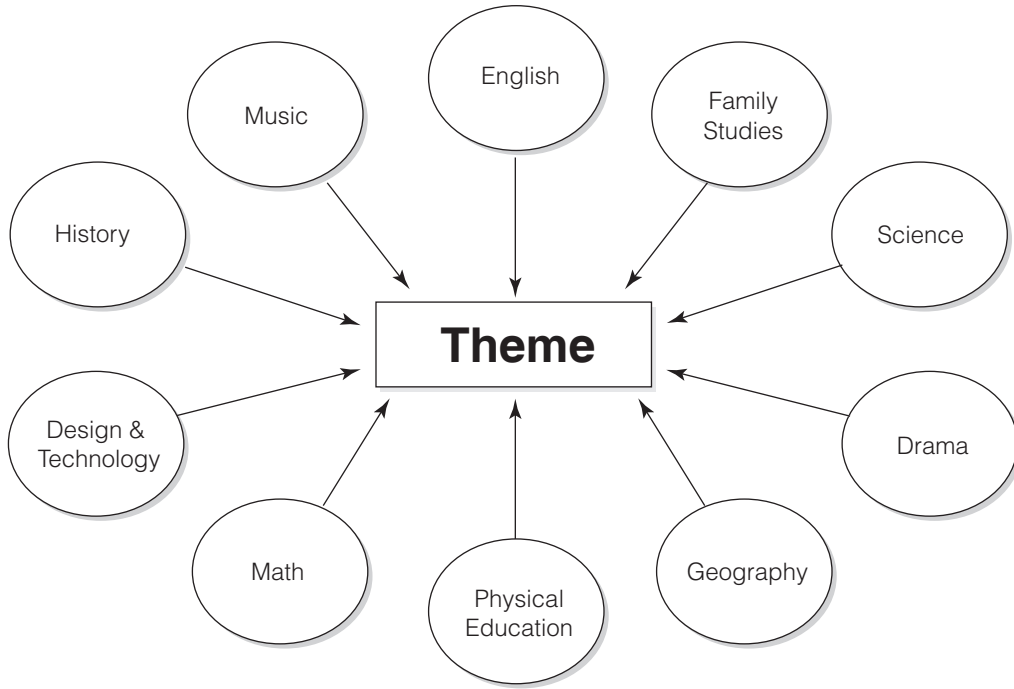
the definitions proposed by other educators over the decades. The three categories offer a starting point for understanding different approaches to integration.

Multidisciplinary Integration

Multidisciplinary approaches focus primarily on the disciplines. Teachers who use this approach organize standards from the disciplines around a theme. Figure 1.1 shows the relationship of different subjects to each other and to a common theme. There are many different ways to create multidisciplinary curriculum, and they tend to differ in the level of intensity of the integration effort. The following descriptions outline different approaches to the multidisciplinary perspective.

Intradisciplinary Approach. When teachers integrate the subdisciplines within a subject area, they are using an intradisciplinary approach. Integrating reading, writing, and oral communication in language arts is a common example. Teachers often integrate history, geography, economics, and government in an intradisciplinary social studies program. Integrated science integrates the perspectives of subdisciplines such as biology, chemistry, physics, and earth/space science. This type of intradisciplinary program is offered for middle school by the University of Alabama's Center for Communication and Educational Technology. Through this integration, teachers expect students to understand the connections

1.1 The Multidisciplinary Approach



between the different subdisciplines and their relationship to the real world. The program reports a positive impact on achievement for students who participate. (See <http://www.ccet.ua.edu> for more information.)

Fusion. In this multidisciplinary approach, teachers fuse skills, knowledge, or even attitudes into the regular school curriculum. In some schools, for example, students learn respect for the environment in every subject area. At Mount Rainier Elementary in Washington State, teachers incorporate the theme of peace into every thread of the school's curriculum (Thomas-Lester, 2001). Students begin each week

promising to be peaceful, respectful, and responsible. They follow a list of responsibilities and learn about peace in their classes. In reading, for example, students analyze positive characteristics of people in stories; in social studies, they learn the importance of cultures working together. The school records the number of days without a fight as “peace days”; teachers write the accumulated number of peace days on the blackboard in every classroom. Teachers wear peace signs, and students greet each other with the peace sign.

Fusion can involve basic skills. Many schools emphasize positive work habits in each subject area. Educators can fuse technology across the curriculum with

computer skills integrated into every subject area. Literacy across the curriculum is another example of fusion. The November 2002 issue of *Educational Leadership* featured the theme of “Reading and Writing in the Content Areas” and focused on how to fuse literacy into the curriculum.

To prepare students for the compulsory 10th grade literacy test, 9th grade teachers at North Park Secondary School in the Peel District School Board in Ontario developed subject-specific tasks for literacy skills. For example, students practiced skills related to developing supported opinions on disposal of hazardous waste in science, immigration policies in geography, correct approaches to problem solving in math, the influence of peer pressure in family studies, and part-time employment and its impact on teens in business studies. Teaching literacy skills across the curriculum facilitated a low-risk environment for the eventual testing in the next year (Patten, 2001).

Service Learning. Service learning that involves community projects that occur during class time falls under the category of multidisciplinary integration. At Spring Valley School in Columbia, South Carolina, more than 1,200 Spanish-language students engaged in service learning projects. In one project, they distributed 20 tons of food, clothing, medicine, and household products to needy new arrivals in the area with the fastest-growing Hispanic population (Glenn,

2001). At Topa Topa Elementary School at Ojai, California, 5th and 6th grade students created pamphlets on the pros and cons of pesticides to explain how crop pickers can protect themselves against the substances. Students passed out the brochure, written in Spanish and English, to workers and consumers throughout the Ojai Valley. Through the project, students fulfilled state-required standards for language arts, science, and social studies (Ragland, 2002).

Glenn (2001) found that more than 80 percent of the schools that integrate service learning into the classroom report an improvement in grade point averages of participating students. For example, when teachers integrated service learning into the curriculum in a Springfield, Massachusetts, high school, the dropout rate dropped from 12 percent to 1 percent, the number of students going to college increased by 22 percent, and those achieving a grade point average of 3.0 or higher increased from 12 percent to 40 percent. According to Glenn, such programs foster a lifelong commitment to civic participation, sharpen “people skills,” and prepare students for the work force.

Learning Centers/Parallel Disciplines. A popular way to integrate the curriculum is to address a topic or theme through the lenses of several different subject areas. In an elementary classroom, students often experience this approach at learning centers. For example, for a theme such as

“patterns,” each learning center has an activity that allows the students to explore patterns from the perspective of one discipline—math, language, science, or social studies. As students move through the learning centers to complete the activities, they learn about the concept of patterns through the lenses of various disciplines.

In the higher grades, students usually study a topic or theme in different classrooms. This may take the form of parallel disciplines; teachers sequence their content to match the content in other classrooms. Students often experience American literature and American history as parallel disciplines. They study a particular period of history and read literature from that period. For example, students read *The Red Badge of Courage* in English while studying the Civil War in history. Students usually must make the connections themselves.

Theme-Based Units. Some educators go beyond sequencing content and plan collaboratively for a multidisciplinary unit. Educators define this more intensive way of working with a theme as “theme-based.” Often three or more subject areas are involved in the study, and the unit ends with an integrated culminating activity. Units of several weeks’ duration may emerge from this process, and the whole school may be involved.

A theme-based unit involving the whole school may be independent of the regular school schedule. At Fitch Street

School in the District School Board of Niagara in Ontario, Ellie Phillips and four of her colleagues collaborated on a two-week, cross-grade curriculum unit on the Olympic Games. Curriculum planning required eight half-hour sessions. Teachers grouped students into five multiage classes representing grades 4, 5, 6, and 7. The multiage groups met for one hour daily for nine days. In these groups, students devised a performance task that they presented on the final day of the unit. The teachers observed numerous benefits, such as the following:

- Students exhibited excellent on-task behavior.
- Students worked collaboratively.
- Multiage teams formed within the multiage classes.
- Students were engrossed both as presenters and as the audience for the half-day performance task presentations.
- Students used a wide range of presentation products, such as video, debate, sculpture, and so on.
- Students demonstrated depth of understanding of topics as a result of their sustained interest around various questions (e.g., Are the Olympics relevant today? Does the Olympic creed stand the test of time?).
- Fewer recess problems occurred during this two-week period.
- Teachers enjoyed the process and the results.

Other thematic programs may involve teachers across the same grade. Charles Jervis, Jerry Sauter, and Steve Bull of Auburn High School in Riner, Virginia, have collaborated for many years to teach thematic units in grade 11. They have done this without the luxury of common planning time. One topic they have developed is Exploring a Local Ecosystem from Multiple Perspectives. Students explore the Pandapas Pond from the different disciplinary lenses of science (earth sciences, biology, chemistry, and physics), English (genre readings, analyses, and communication skills), and math (data analysis tools and techniques). The teachers carefully connect the activities to the standards in each discipline. Over time, they have developed a long list of possible culminating activities. They update their Web site continually and use it as a teaching tool with students. The site offers many interesting options for those interested in this type of multidisciplinary approach (see <http://www.mcps.org/pandapas/>).

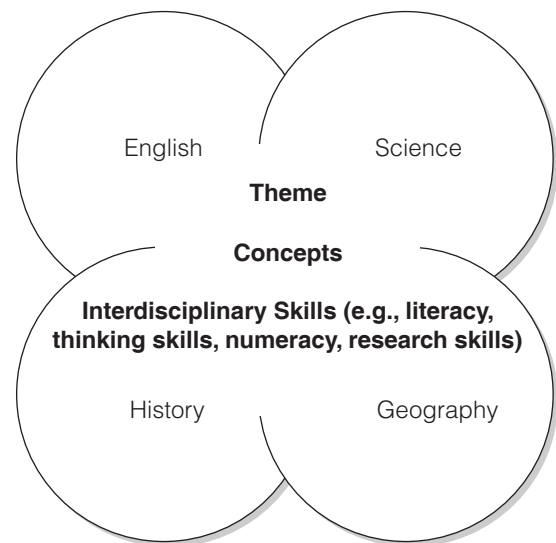
Interdisciplinary Integration

In this approach to integration, teachers organize the curriculum around common learnings across disciplines. They chunk together the common learnings embedded in the disciplines to emphasize interdisciplinary skills and concepts. The disciplines are identifiable, but they assume less importance than in the multidisciplinary approach. Figure 1.2 illustrates the interdisciplinary approach.

The children in Florida making wind and rain machines while learning language skills are experiencing interdisciplinary curriculum. They are learning the interdisciplinary skill of communication (thinking and writing in a structured and coherent way). The teacher also focuses on “big ideas” in the concepts of evaporation, condensation, and thermal energy. These concepts transfer to other lessons beyond wind and rain machines; thus, the lesson develops a higher level of thinking than if students simply focused on the wind and rain machines.

Is the example of students learning math and core curriculum through clogging and the arts an interdisciplinary one? Yes, if students are learning skills and concepts beyond the immediate lesson. In Learning Through the Arts™, for example,

1.2 The Interdisciplinary Approach



students learn math and science concepts and skills while singing, sculpting, painting, and dancing. Artists from the community collaborate with teachers to create integrated lessons that focus on standards. A three-year study of more than 6,000 elementary students participating in this program showed an 11-point increase in math scores among students in 170 schools across Canada. Literacy scores remained the same; however, students reported being happier going to school, and researchers found that students were more engaged in their lessons (Upitis & Smithirin, 2002). The final report and a vivid description of the program are available at <http://www.ltta.ca>.

At Mott Hall Academy in New York City, students work on interdisciplinary projects that integrate laptop computers. Mott Hall is a math, science, and technology academy for students in grades 4 through 8 who are primarily Hispanic. Every student and teacher has a laptop computer. Teachers integrate computer use into the curriculum, rather than adapting curriculum to the use of computers. In Sandra Skea's 5th grade class, for example, students constructed handmade kites from material such as paper, straws, aluminum foil, skewers, and string. To engage students' imagination, Skea began by reading a story about kites. Students studied such diverse topics as electromagnetism and the use of kite flying in celebrations. They developed a deep understanding of princi-

ples of ratio and proportion as they designed and refined their kites—first on the computer and then by hand. Students also wrote poetry and prose about kites. Skea used the projects as evidence that students not only met, but also exceeded, the standards. She used rubrics to show students how the projects related to grade-level standards and provided the criteria for evaluation. Beyond the academic content, these students learned generic skills related to working together, research, writing, and design and construction (Furger, 2001).

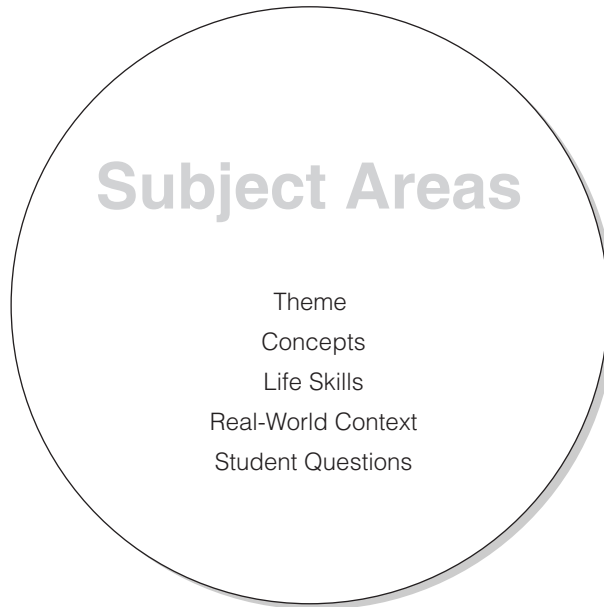
Transdisciplinary Integration

In the transdisciplinary approach to integration, teachers organize curriculum around student questions and concerns (see Figure 1.3). Students develop life skills as they apply interdisciplinary and disciplinary skills in a real-life context. Two routes lead to transdisciplinary integration: project-based learning and negotiating the curriculum.

Project-Based Learning. In project-based learning, students tackle a local problem. Some schools call this problem-based learning or place-based learning. According to Chard (1998), planning project-based curriculum involves three steps:

1. Teachers and students select a topic of study based on student interests, curriculum standards, and local resources.

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2. The teacher finds out what the students already know and helps them generate questions to explore. The teacher also provides resources for students and opportunities to work in the field.
3. Students share their work with others in a culminating activity. Students display the results of their exploration and review and evaluate the project.

Studies of project-based programs show that students go far beyond the minimum effort, make connections among different subject areas to answer open-ended questions, retain what they have learned, apply learning to real-life problems, have fewer

discipline problems, and have lower absenteeism (Curtis, 2002). Newsome Park Elementary School in Virginia, described in Chapter 9, successfully embraces the project method.

At Grand River Collegiate Institute in the Waterloo Region District School Board in Ontario, 11th grade students took on the problem of improving the city image (Drake, 2000). This project did not originate in any subject area; students completed project work in a separate time slot scheduled into the school day. After extensive research, students wrote proposals to renew or enhance the city's image and presented the proposals to a group of external evaluators. Student assessment considered teamwork, critical

thinking skills, problem solving, and time management. Interestingly, more than one proposal received serious consideration by the city council.

Negotiating the Curriculum. In this version of the transdisciplinary approach, student questions form the basis for curriculum. Mark Springer of Radnor, Pennsylvania, negotiated an integrated curriculum with students (Brown, 2002). Springer led the nationally known Watershed program for 11 years. His current curricular program is Soundings. In Soundings, 8th grade students develop their own curriculum, teaching methods, and assessments around areas of interest to them. Themes that students have developed include Violence in Our Culture, Medical Issues Affecting Our Lives, and Surviving Alien Environments.

The Soundings program is based on the work of James Beane (1990/1993, 1997), who advocates theme studies revolving around personal growth and social issues. On standardized tests, Soundings students perform about the same as students who have not participated in the program. Parents are overwhelmingly positive about the program, and high school teachers report that Soundings graduates appear to discuss topics at a more sophisticated level than students who have not been in the program. (See Chapter 10 for a discussion of the Alpha program, which is also based on James Beane's work.)

How the Three Approaches Connect with Each Other

When Susan led a provincial team in developing an integrated curriculum, she noticed how her team suddenly shifted into deeper and deeper levels of connection (Drake, 1991). The boundaries of the disciplines seemed to dissolve abruptly. During the early '90s, Ontario mandated integrated curriculum for kindergarten through grade 9. Susan interviewed others who were developing integrated curriculum and reported similar experiences of dissolving the boundaries (Drake, 1993). As soon as they made one set of connections, another set appeared. In Rebecca's context, she found the same dissolving of the boundaries (Burns, 1995).

Describing her experiences to a colleague, Susan discovered there were academic terms for this phenomenon: multidisciplinary, interdisciplinary, and transdisciplinary. The essential difference between the three approaches was the perceived degree of separation that existed between subject areas. Given our experiences at the time, both of us believed that the three approaches fit on an evolutionary continuum. Other theorists have also offered continuums (Fogarty, 1991; Jacobs, 1989).

Standards-based approaches further blur the boundaries of these categories. Multidisciplinary integration might remain somewhat distinct because the procedures

of the disciplines are dominant. Current thinking, however, suggests that even intradisciplinary projects should include math and literature/media to be rich and vibrant (Erickson, 1998). Interdisciplinary approaches offer an excellent fit for standards when educators approach them through a backward design process. Although teachers might organize transdisciplinary curriculum around a real-world context, the reality of covering the standards and grading in distinct subject areas quickly brings them back to the disciplines.

Is there an evolutionary continuum? We suspect that obvious differences will continue to exist in the extent to which educators choose to integrate and for how long. We believe that educators will continue to experience deepening connections as they become more experienced in this area. In an era of standards and accountability, no one approach seems preferable. Indeed, they seem more and more alike as teachers integrate standards-based planning with effective teaching and learning practices. The multidisciplinary, interdisciplinary, and transdisciplinary perspectives offer different maps to begin the design process. Teachers can use any of the approaches at any level of education, in a single classroom or in a team approach.

Figure 1.4 shows the relationships among the three different approaches. Some differences in intent are apparent. We found, however, that the educators who actually implement integrated approaches are the same educators who are interested in the most effective ways to teach. They are the ones who constantly ask, “How can I engage all of my students in this learning?” They also are the ones who use the most effective planning strategies, such as a backward design process, and are concerned with authentic assessment practices. Therefore, despite some differences in the degree and the intent of integration, the three approaches share many similarities. The centrality of standards and the need for accountability bring the three approaches closer together in practice.

In this book, we focus on the basics of good curriculum design that apply regardless of the degree of integration an educator may wish to embrace. In other words, the principles we present are worthy of any curriculum design. In addition, all the examples in this book are standards-based. We believe they offer substantive options for educators to develop relevant curriculum in their own contexts.

1.4 Comparing and Contrasting the Three Approaches to Integration

	Multidisciplinary	Interdisciplinary	Transdisciplinary
Organizing Center	Standards of the disciplines organized around a theme	Interdisciplinary skills and concepts embedded in disciplinary standards	<ul style="list-style-type: none"> • Real-life context • Student questions
Conception of Knowledge	<ul style="list-style-type: none"> • Knowledge best learned through the structure of the disciplines • A right answer • One truth 	<ul style="list-style-type: none"> • Disciplines connected by common concepts and skills • Knowledge considered to be socially constructed • Many right answers 	<ul style="list-style-type: none"> • All knowledge interconnected and interdependent • Many right answers • Knowledge considered to be indeterminate and ambiguous
Role of Disciplines	<ul style="list-style-type: none"> • Procedures of discipline considered most important • Distinct skills and concepts of discipline taught 	Interdisciplinary skills and concepts stressed	Disciplines identified if desired, but real-life context emphasized
Role of Teacher	<ul style="list-style-type: none"> • Facilitator • Specialist 	<ul style="list-style-type: none"> • Facilitator • Specialist/generalist 	<ul style="list-style-type: none"> • Coplanner • Colearner • Generalist/specialist
Starting Place	Disciplinary standards and procedures	<ul style="list-style-type: none"> • Interdisciplinary bridge • KNOW/DO/BE 	<ul style="list-style-type: none"> • Student questions and concerns • Real-world context
Degree of Integration	Moderate	Medium/intense	Paradigm shift
Assessment	Discipline-based	Interdisciplinary skills/ concepts stressed	Interdisciplinary skills/ concepts stressed
KNOW?	Concepts and essential understandings across disciplines	Concepts and essential understandings across disciplines	Concepts and essential understandings across disciplines
DO?	<ul style="list-style-type: none"> • Disciplinary skills as the focal point • Interdisciplinary skills also included 	<ul style="list-style-type: none"> • Interdisciplinary skills as the focal point • Disciplinary skills also included 	Interdisciplinary skills and disciplinary skills applied in a real-life context
BE?	<ul style="list-style-type: none"> • Democratic values • Character education • Habits of mind • Life skills (e.g., teamwork, self-responsibility) 		
Planning Process	<ul style="list-style-type: none"> • Backward design • Standards-based • Alignment of instruction, standards, and assessment 		
Instruction	<ul style="list-style-type: none"> • Constructivist approach • Inquiry • Experiential learning • Personal relevance • Student choice • Differentiated instruction 		
Assessment	<ul style="list-style-type: none"> • Balance of traditional and authentic assessments • Culminating activity that integrates disciplines taught 		