7/1/2011

KENTUCKY DEPARTMENT OF EDUCATION

MODEL CURRICULUM FRAMEWORK 2011

"The network of people and resources involved in providing educational opportunities to a child can be truly global."

21st Century Skills: Learning for Life in Our Times (Trilling and Fadel, 2009)

UNBRIDLED LEARNING
College/Career Readiness for All

"Our world has changed dramatically since the reforms of 1990. We must now turn our focus to the future and again to our schools to ensure that our strategies and programs are designed to meet the challenges of the 21st century." Kentucky Governor Steven L. Beshear at the launch of the Transforming Education in Kentucky (TEK) task force in November 2009

FOREWORD

KDE Mission

The Kentucky Department of Education's mission is to prepare all Kentucky students for next-generation learning, work and citizenship by engaging schools, districts, families and communities through excellent leadership, service and support.

KDE Vision

ALL children proficient and prepared for success

"The key to our success in transforming education in Kentucky will reside in our ability to focus on a few goals with a few strategies that are done with precision and fidelity." Terry Holliday, Ph.D.
Commissioner of Education
Commonwealth of Kentucky

I am pleased to introduce the *Kentucky Model Curriculum Framework,* which will guide efforts to rethink and reshape learning in Kentucky to ensure the readiness of our young people to meet the challenges of our changing times. The purpose of this resource is to inspire, inform and initiate a call to action as the demands of the workplace have become more complex, as the youth of today embrace digital lifestyles and as the science of learning offers new research for reconsidering the delivery of instruction.

We know high school graduates today face higher expectations than ever before. For these graduates to become fully literate, college-and career-ready citizens, schools and districts must prepare students for a vastly different future. A 21st-century curriculum must produce innovative schools and programs, reflecting a dramatic shift in the focus of education.

Building on the guidance offered here in the *Kentucky Model Curriculum Framework*, district leaders are encouraged to:

- consider innovations in the operational design of "school" to allow for greater collaboration within schools and to forge a strong school and community vision for learners
- develop strategies and ideas for flexibility in the use of time for learning (e.g., schedules, calendars, virtual opportunities, out-of-school experiences)
- work collaboratively with partners and galvanize the support of the community to ensure that learning experiences offered both in-school and out-of-school are highly effective, meaningful and relevant

Schools and community partners must understand and acknowledge the changing nature of the challenges and demands that continue to shape the learner of the future. Through a collective commitment to equip our young people with the knowledge, character and capabilities needed to take charge of their learning and their lives; our challenge is to build on this framework. District and school leaders play a vital role in leading the conversation around the redesign of learning experiences that offer successful engagement and achievement for the 21st -century learner.

Terry Holliday, Ph.D.
Commissioner of Education, Commonwealth of Kentucky

Kentucky has a history as a leader in education reform from the Kentucky Education Reform Act in 1990 to the 2009's Senate Bill 1. As a result, Kentucky is poised to lead the nation again. We are defining a system that will prepare students as next generation learners while investing in our human capital by developing support systems through professional growth and learning opportunities for next-generation professionals.

The *Kentucky Model Curriculum Framework* serves as a facilitation guide to help an instructional supervisor, principal, and/or teacher leader provide a rationale for the need to revisit curriculum planning, offering some background information and exercises to generate "future-oriented" thinking, and suggesting a process for designing and reviewing the local curriculum. As content standards are being revised, educators and communities must guarantee 21st-century readiness that will prepare learners for college and career success. The students of the Commonwealth expect a curriculum designed and structured for a rigorous, relevant and personalized learning experience, including anytime/anywhere learning opportunities. This resource will ensure local district and/or school curriculum reflects the tools, environments, and guiding principles to support 21st- century learning practices.

> Section 1. KRS 158.6451 (2) "The Kentucky Board of Education shall disseminate to local school districts and schools a model curriculum framework which is directly tied to the goals, outcomes, and assessment strategies developed pursuant to this section and KRS 158.6453. The framework shall identify teaching and assessment strategies, instructional material resources, ideas on how to incorporate the resources of the community, a directory of model teaching sites, alternative ways of using school time, and strategies to incorporate character education throughout the curriculum."

The 21st-century knowledge economy seeks knowledge workers and innovators. This generation of learners and the next will have grown up surrounded by digital media and will use these multi-literacies as their thinking tools. They have different expectations for their learning experiences. These changing expectations on the part of the learner and the vast body of learning research can be used to direct and guide efforts around curriculum planning and implementation. Schools, districts, families and other education partners are committed to ensuring that Kentucky children receive a high-quality educational experience from preschool through post-secondary.

Kentuckians, as global citizens, need to be able to think critically, solve problems, innovate, collaborate, and communicate effectively. As a resource, the *Kentucky Model Curriculum Framework* provides a blueprint for schools and districts by engaging families and communities to make this happen. Kentucky's Continuous Instructional Improvement Technology System (CIITS) will be instrumental in allowing links to be embedded, enabling multiple views and access, and providing access to new information and research as it becomes available. This technology platform will ensure educators across the state equitable opportunities to engage in meaningful opportunities and expose them to promising practices from across the state.

Felicia Cumings Smith
Associate Commissioner, Office of Next-Generation Learners

Q & A for District and School Leaders

What is the curriculum framework?

The purpose of the *Kentucky Model Curriculum Framework* (KMCF) for district- and school- level administrators is to serve as a guide for systemic district focus on student learning. It also should inspire creative problem-solving and develop effective curriculum and instructional methods that support intervention as well as enrichment opportunities for all students.

How can this resource help my school/students to achieve at high levels?

As district and school leaders, many obstacles are confronted daily. The KMCF will be a tool for school leaders to find curriculum, assessment, instruction and professional development ideas in a single source.

Many district and school leaders are dealing with issues such as increased instructional rigor with the implementation of new standards as directed by Senate Bill 1. The KMCF can serve as a foundation for professional learning communities among administrators across the state to share effective instructional practices. The framework creates a common language and common goal for all schools in the state.

Why should I lead staff in the use of the *KMCF*?

This resource facilitates shared problem-solving and creativity to rethink and reshape learning in Kentucky. It will act as an impetus for educators to effectively share successful ideas.

How is the *Kentucky Model Curriculum Framework* relevant to my school?

As educators prepare students for the 21st century, we all need to know how 21st-century learning is defined and implemented. The KMCF provides the model and resources for developing curriculum with 21st-century learning skills in one place.

How do I use this resource as a tool?

The KMCF provides a common language for all educators to better facilitate professional development on effective teaching and learning and to promote collegiality. It is vital for all schools and districts to work together; sharing effective curricular strategies so all Kentucky students can succeed.

The KMCF creates a common language and shared model framework, providing a consistent message so that all groups such as school-based decision making councils, parent groups and boards of education have a shared goal. Embedded in the KMCF, school leaders will find several activities to engage staff and other stakeholders in conversations promoting high-quality teaching and learning. Check the Web resource periodically for updates.

The *Kentucky Model Curriculum Framework* creates an ideal model by which educators implement a rigorous and effective curriculum that generates student achievement. It consistently establishes what professional educators are expected to do for the next generation of learners of the Commonwealth of Kentucky.

Overview of this resource:

Kentucky's Vision for Next-Generation Learners: Students serving actively, productively and ethically as citizens contributing to the local and global community.

WHY

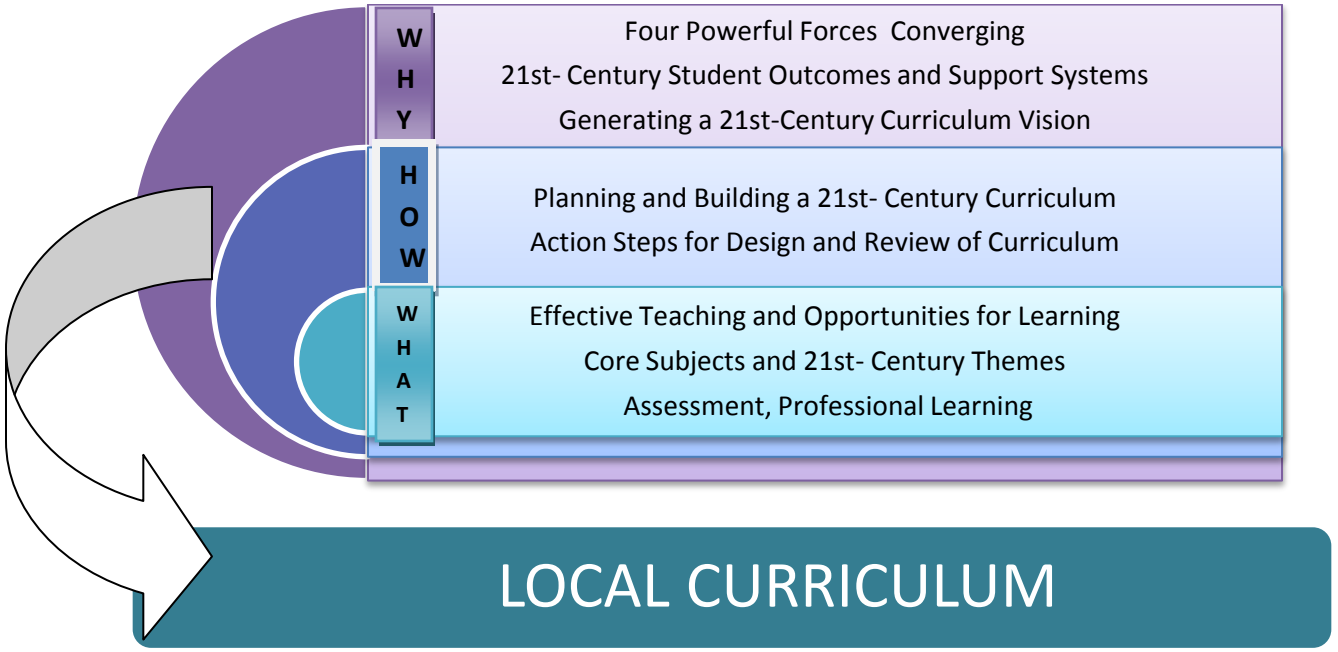
reframe the curriculum in a 21st-century context

HOW

guidance for districts/schools in the design of curriculum

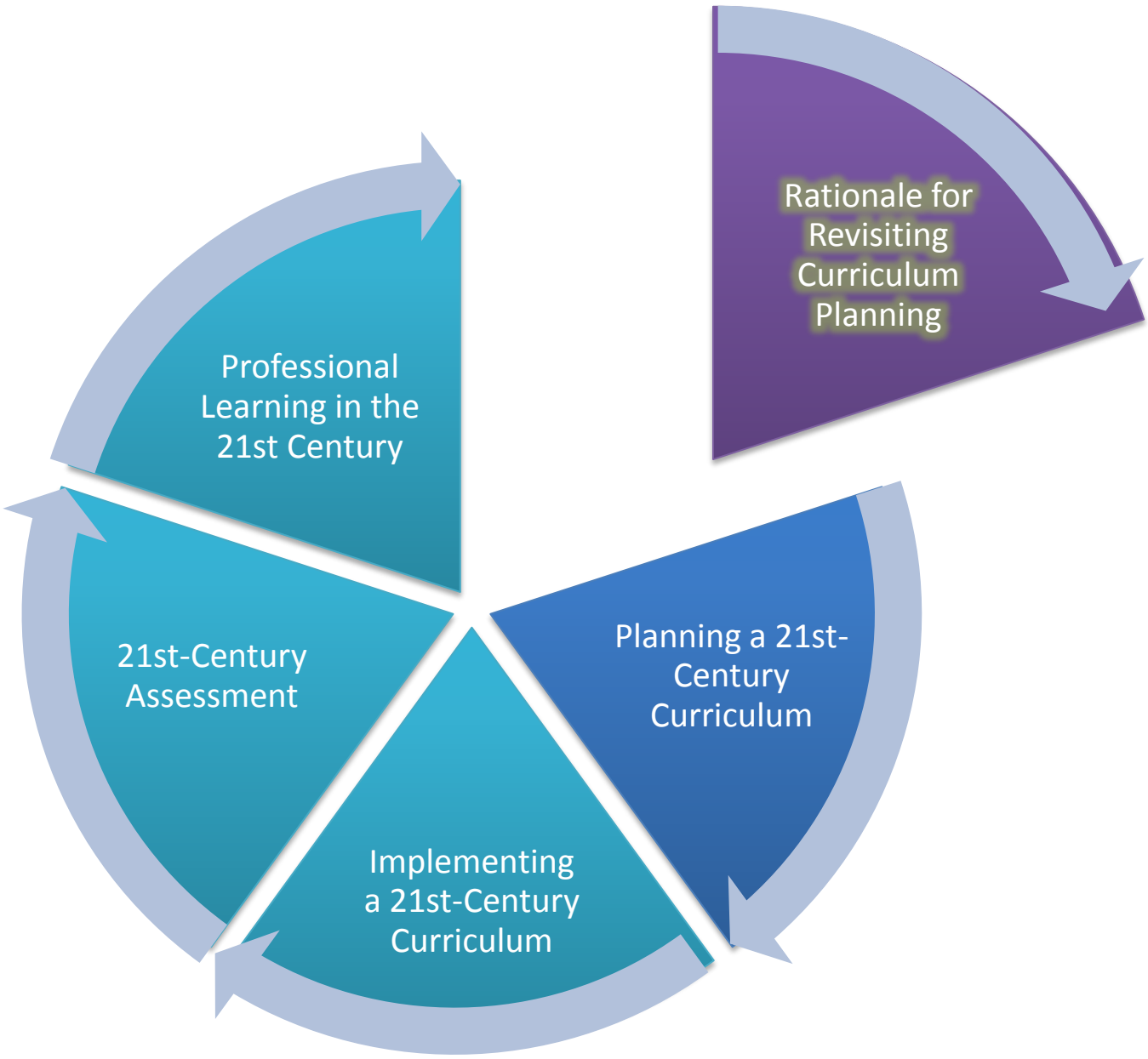
WHAT

set the direction for guiding instruction and learning



Contents

Districts and schools are at different places in the curriculum design conversation and may choose to enter this resource anywhere in the cycle. The sections enable a quick reference in the print version to different parts of the resource and enable multiple views and access in the Web-based resource.



Inside this section:

- Why revisit curriculum planning?
- 21st-Century Student Outcomes and Support Systems
- What is your vision for the Next-Generation Learner?

Why revisit curriculum planning?

Since the publication of *Transformations: Kentucky's Curriculum Framework* 18 years ago, the world has experienced a rapid advancement of information and communication technologies. We need to prepare students for a vastly different future than we have known. Our understanding of the focus of education also needs to shift to reflect an understanding and acknowledgment of the changing nature of the challenges and demands that continue to shape the student of today and tomorrow. As we move toward a 21st-century form of education, our conversations around curriculum must consider the four powerful forces converging and leading us toward new ways of learning for life in the 21st century:

> Our historic shift to a 21st century Knowledge Age, decades in the making, has forever tilted the balance of what is needed and valued in our work, our learning, and our life. In the 21st century lifelong learning is here to stay.
>
> 21at Century Skills: Learning for Life in Our Times, Trilling and Fadel, 2009

- ***Knowledge work***—educational systems around the world are pressured to teach in ways that will produce the knowledge workers and innovators businesses need to be successful in the 21st-century knowledge economy-the emphasis shifts from product based work to service based knowledge work.

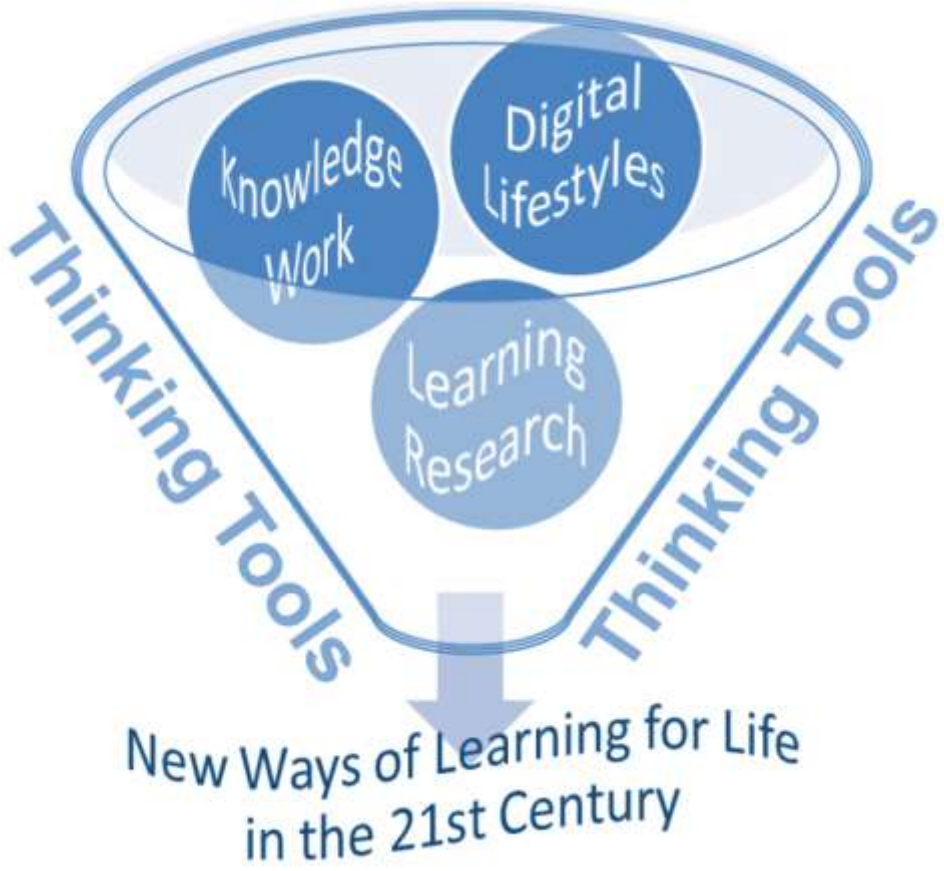
- ***Thinking tools***—technology and the digital devices and services that fill a knowledge worker's toolkit--the thinking tools of our time--may be the most potent forces for change in the 21st century. The speed at which the underlying information and communications technologies are developing is truly astounding. We are rapidly gaining fingertip access to much of the world's available information.

- ***Digital lifestyles***—the first generation to grow up surrounded by digital media is different from the "digital immigrants" who learned to "do technology" later in life. These young people are the first generation in history to know more about the most powerful tools for change in our society--digital information and communications technologies--than their elders: their parents and teachers. This is changing both family and school dynamics, as students switch roles and become digital mentors, and teachers and parents become part-time students of our young digital experts.

- ***Learning research***—five key findings from research in the science of learning can be used to direct and guide our efforts to reshape learning to meet our times: authentic learning, mental model building, internal motivation, multiple intelligences and social learning

These forces are simultaneously creating the need for new forms of learning in the 21st century and supplying the tools, environments, and guiding principles required to support 21st century learning practices. (*21st Century Skills: Learning for Life in Our Times*, Trilling and Fadel, 2009)

Forces Converging



Think and Apply

Take time to focus on the four powerful forces (featured in the diagram above) that are converging with and influencing education. Divide participants into four groups. Assign each group one of the four forces. Have each group identify specific examples of how each of the four forces has changed from 1990 to the present.

Share and compare responses from each group. Note any similarities in responses.

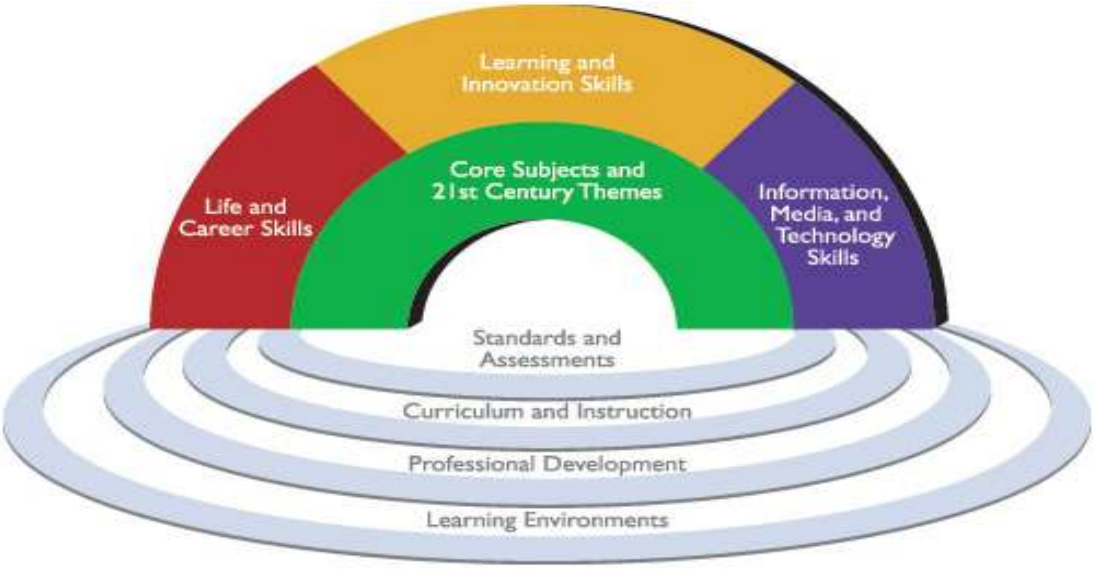
How has the ease of access to information evolved?

What effect, if any, does speed in a digitized world have on communication and thinking?

How does the convergence of the four powerful forces impact our knowledge of how we learn and teach?

21st-Century Student Outcomes and Support Systems

The graphic below depicts the key elements of 21st-century learning. The 21st-Century Skills **student outcomes** are represented by the arches and the **support systems** are represented by the pools at the bottom. This Partnership for 21st Century framework describes the skills, knowledge and expertise students must master to succeed in work and life; it is a blend of content knowledge, specific skills, expertise and multi-literacies. Within the context of core knowledge instruction, students also must learn the essential skills for success in the world of today and tomorrow such as critical thinking, problem-solving, communication and collaboration.



The Partnership for 21st Century Skills **(P21)** is a national organization that advocates for 21st-century readiness for every student. The P21 has been working with states and communities since 2002 to reinvigorate learning to meet the demands of the 21st century. In 2010, Kentucky joined the P21 State Partnership Program, a multi-state coalition aimed at fusing the three Rs and four Cs (critical thinking and problem-solving**;** communication; collaboration; and creativity and innovation). Along with Kentucky's Governor and Commissioner of Education, the initiative is supported by the Kentucky Council on Postsecondary Education, Kentucky Board of Education, Kentucky Education Association, and Kentucky School Media Association.

21st-century context to the Learning Goals and Capacities

The chart below is neither exhaustive nor exclusive; however, it is grounded in the underlying beliefs stated in the Learning Goals and Capacities for Kentucky's students as outlined in legislation. The headings for each column are the student outcomes identified by the 21st Century Partnership as necessary for success in life and career. Considering these outcomes together with the four powerful forces (knowledge work, thinking tools, digital lifestyles, learning research) can serve as a starting point for expanding the use and further development of the Learning Goals and Capacities to reflect a 21st-century context. As a result, educators, families and communities who find themselves in increasingly complex and unfamiliar situations will be better equipped to prepare the next generation of students.

Life and Career Dispositions	Learning and Innovation	Information, Media, and Technology Readiness
• **Excellence**--achieving at high levels and persevering regardless of circumstances • **Diversity**--promoting an appreciation for one's own cultural/historical background and respecting the history, language and tradition of other cultures • **Equity**--exhibiting qualities of human worth and justice (i.e., ethnicity, sexual orientation, geography, disability, religion, gender and socio-economic status) • **Ethical behavior**--willingness to think about, articulate and support beliefs, judgments, and behavior • **Qualities of character**--exhibiting altruism, citizenship, courtesy, hard work, responsibility • **Relating to others**--interacting effectively with a diverse range of people in a variety of contexts	• **Think and Apply**--using creative, critical and metacognitive (thinking about our thinking) processes to make sense of information, experiences and ideas. Through these processes develop understanding, make decisions, shape actions or construct knowledge • **Intellectual curiosity**--actively seeking, using and creating knowledge • **Reflect**--on own learning, drawing on personal knowledge and intuitions, asking questions and challenging the basis of assumptions and perceptions • **Manage Self**-- seeing self as capable, self-motivation, a "can-do" attitude • **Independence**--enterprising, resourceful, reliable and resilient	• **Multi-literacies**-- using languages and symbols to produce texts of all kinds: written, oral/aural, and visual; informative and imaginative; informal and formal; mathematical, scientific, and technological • **Communication**--recognizing how choices of language, symbol or text affect people's understanding and the ways in which they respond--competent users interpret and use words, numbers, images, movement, metaphor and technologies in a range of contexts • **ICT (information, communication technology)**--using ICT (including, where appropriate, assistive technologies) to access and provide information and to communicate with others

Think and Apply

Think of a recent lesson you taught or observed in a classroom or out-of-school experience. Chart examples of evidence that students were using the following skills:

EVIDENCE:

- Critical Thinking
- Problem Solving
- Good Communication
- Good Collaboration
- Information and Technology Literacy
- Flexibility and Adaptability
- Innovation and Creativity
- Global Competency
- Environmental Awareness

In small groups, share responses and discuss the reflections of group members about opportunities offered to young people to exhibit these 21st-century readiness skills.

The following is used with permission from John Wiley & Sons, Inc. and may prompt response to the question:

What is your vision for the Next-Generation Learner?

Questions to Consider:

- How has the world changed, and what does this mean for education?
- What does everyone need to learn now to be successful?
- How should we learn all this?
- How early can we start?
- How is 21st-century learning different from learning in the 20th century and what does it really look like?
- How will 21st-century learning evolve through the century?
- How will a 21st-century learning approach help solve our global problems?

What are districts/schools doing to shift their balance toward 21st-century learning? What does this shifting balance look like? What does this mean for teachers and other adults working with children in school classrooms and other community settings each day? The following exercise will be helpful to district/school planning teams as a starting point in curriculum conversations leading to a curriculum vision. Following each question are some responses these questions have generated during similar conversations. *[Note to the facilitator(s): These responses may prove helpful in moving toward a "future oriented" conversation and curriculum, but they would not necessarily be shared with participants.]*

The four question exercise:

Question #1: What *will the world be like twenty or so years from now when your students have left school and are out in the world?* Think about what life was like twenty years ago and all the changes you have seen happen. Then imagine what will happen in the next twenty years.

Usually evokes responses that project current events, issues and challenges into the future. Samples of typical responses:

- a "smaller world," more connected by technology and transport
- a mounting information and media tidal wave that needs taming
- global economic swings that affect everyone's jobs and incomes
- strains on basic resources-water, food and energy
- the acute need for global cooperation on environmental challenges
- increasing concerns about privacy, security and terrorism
- the economic necessity to innovate to be globally competitive
- more work in diverse teams spanning languages, cultures, geographies and time zones
- the need for better ways to manage time, people, resources and projects

Question #2: ***What skills will students need to be successful in this world you have imagined twenty years from now?***

[This question] Inevitably generates most of the 21st-century skills*, [which also may spark conversation regarding the fact that these skills actually begin to develop in early childhood]* including values and behaviors such as curiosity, caring, confidence and courage that often accompany the learning of these skills and can be placed in three useful categories.

Learning and Innovation Skills:

Critical Thinking and Problem-Solving
Communications and Collaboration
Creativity and Innovation

Digital Literacy Skills:

Information Literacy
Media Literacy
Information and Communication Technologies (ICT) Literacy

Career and Life Skills:

Flexibility and Adaptability
Initiative and Self-Direction
Social and Cross-Cultural Interaction
Productivity and Accountability
Leadership and Responsibility

"The illiterate of the 21st century are not those that cannot read or write, but those that cannot learn, unlearn, and relearn." Alvin Toffler

Question #3: Now think about your own life and the times when you were really learning, so much and so deeply, that you would call these the "peak learning experiences" of your life. *[Don't limit your thinking to "school" learning experiences. Consider expanded learning opportunities and out-of-school time (after-school, summer programs, specific organizational groups, private and faith-based child care, home, preschool) as well.]* ***What were the conditions that made your high-performance learning experiences so powerful?***

Generates collective answers that are even more intriguing…

- very high levels of learning challenge, often coming from an internal personal passion
- equally high levels of external caring and personal support-a demanding but loving teacher, a tough but caring coach or an inspirational learning guide
- full permission to fail-safely and with encouragement to apply the hard lessons learned from failure to continuing the struggle with the challenge at hand-failures, well-supported, can often be better teachers than easy successes (though this is certainly not a very popular approach in today's "test success"-driven schools)

Before going on to Question #4, look over your answers to the first three questions and think about how most students currently spend each day in school, after school, and during the summer. Then consider the final question: **Question #4: *What would learning be like if it were designed around your answers to the first three questions?***

Consistently spotlights the distance between what we all know learning should be and what most schools end up doing each day:

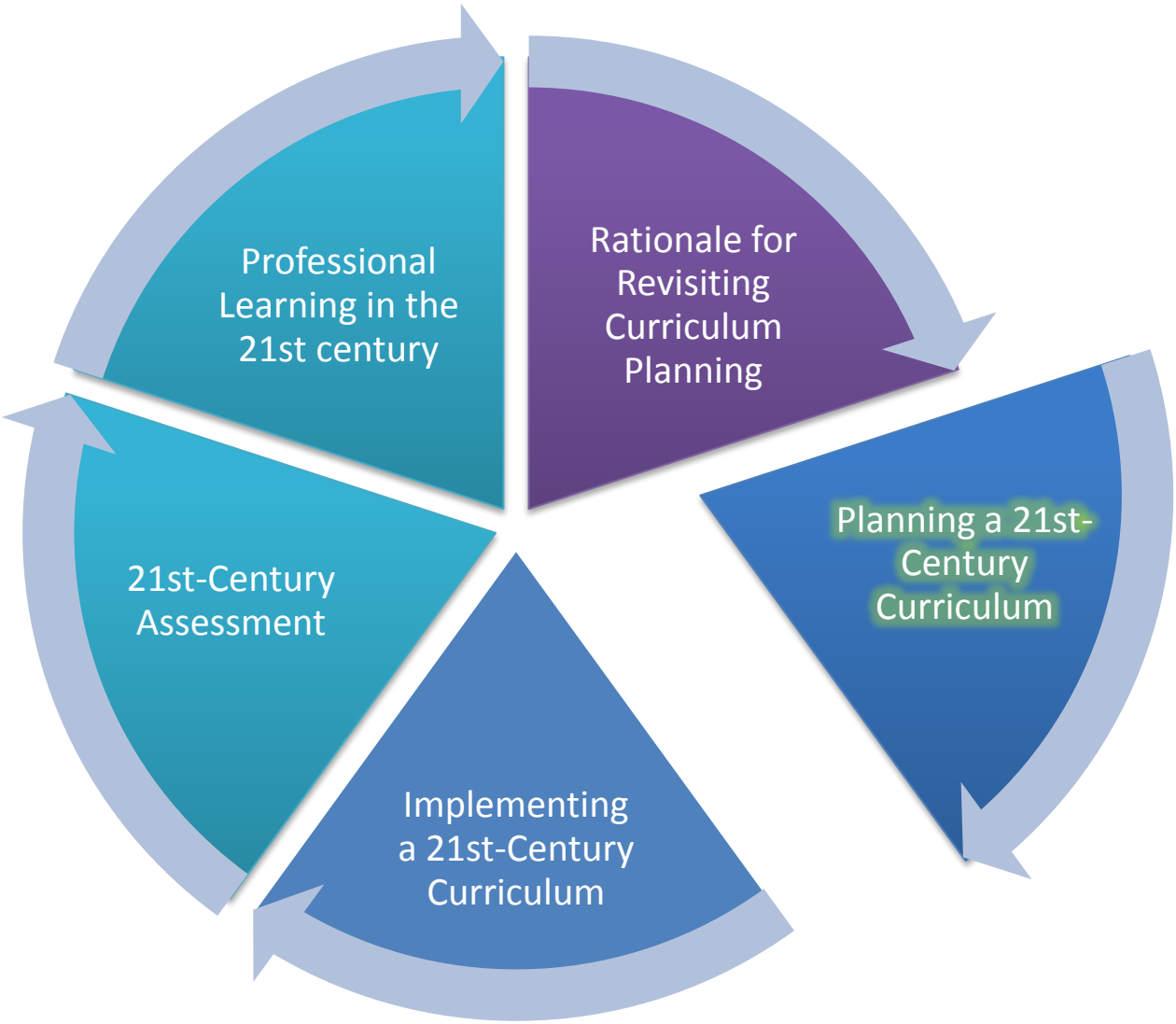
- The world of work is increasingly made of teams working together to solve problems and create something new –why do students mostly work alone and compete with others for teacher approval?
- Technology is more a part of our children's lives each day –why should they have to check their technology at the classroom door and compete for limited school computer time?
- The world is full of engaging, real-world challenges, problems, and questions- why spend so much time on disconnected questions at the end of a textbook chapter?
- Doing projects on something one cares about comes naturally to all learners-why are learning projects so scarce inside so many classrooms?
- Innovation and creativity are so important to the future success of our economy-why do schools spend so little time on developing creativity and innovation skills?
- Learning is an ongoing process that extends beyond the reach of the school day – why aren't schools maximizing afterschool and expanded learning opportunities (ELO) through alignment and linkages to mainstream education goals?

(*21st Century Skills: Learning for Life in Our Times*, Trilling and Fadel, 2009)

Read and discuss the report about what students think. ***Creating Our Future - Students Speak Up about their Vision for 21st Century Learning***

Think and Apply

What next steps for planning the 21st-century curriculum are indicated when considering the responses to the questions and the voices of students?



Inside this section:

- What should comprise a curriculum for a next-generation learner?
- The School Curriculum: Design and Review

What should comprise a curriculum for a next generation learner?

Curriculum is a shared responsibility of family, school, and community.

It is essential for educators to approach designs for teaching and learning with the understanding that curriculum is much more than the teaching of subject-area content or standards. Curriculum entails the systematic design of entire learning environments, including the knowledge, skills, abilities, and understandings learners are to acquire; it also includes considerations of classroom design for equal access (e.g., use of captioning and sound field systems to meet the needs of diverse learners), school infrastructure and resources, engagement with the community, and the intentional modeling of social interactions around learning between teachers, learners, administrators, families and other stakeholders.

Learning in the 21st century demands new ways of thinking and a new set of partnerships. Connections between schools, families, and the multiple resources that exist in a community to improve outcomes for students can promote a shared responsibility and a shared accountability between schools, families and community providers. Building partnerships with businesses, foundations, nonprofit educational organizations, community groups and other schools and educational institutions across the globe will bring new opportunities for students, educators, families and communities to collaborate and learn from a world of experts preparing for work and life in the 21st century.

Contemporary society is radically different in the 21st century than it was even twenty years ago. Because of these differences, curriculum requires standards-based, *relevant* tasks and engaging teaching strategies that complement contemporary students' needs in terms of the activities they will participate in during their future lives and educations beyond P-12 schooling. Because learning occurs in a global context, "educational systems must create a culture of inquiry and collaboration that enables all students and teachers to learn for their own sake and for the good of a culturally diverse democratic society in an interdependent world." (From Principles for Learning: A foundation for transforming K-12 education by ACTE, COSN, NCSS, NCTE, NCTM, and NSTA)

It is important to have representation of these groups in conversations regarding curriculum planning. The National Parental Information and Resource Center asserts that "To ensure that the students of today are ready for the careers of tomorrow, families, schools, and community groups need to work together to promote engagement that is systemic, sustained, and integrated" (www.nationalpirc.org/engagement).

Focus is on the learner.

Curriculum is **defined** in many ways: *course of study; structured teaching plan for a course; both the content (the material to be learned), and process of learning (the actions and resources involved in teaching and learning); the planned interaction of pupils with instructional content, materials, resources, and processes for evaluating the attainment of educational objectives.* Based on this broad definition of curriculum, planning and implementation proceeds by systematically assessing where young people are in their individual learning and abilities, then designing evidence-based plans for helping them progress toward common standards and learning targets. Curriculum planning, from early childhood through graduation, involves using data about students' needs and abilities to employ varying degrees of structure and pacing in concert with input from parents/guardians and other educators both inside and outside of the school. It requires systematic implementation of various instructional strategies, as well as a consistent focus on helping students to mature and be socialized in collaborative groups that support their growth as lifelong learners. The goal of such a curriculum is to produce students that are ethical citizens in a democratic global society, and to help them become self-sufficient individuals who are prepared to succeed in an ever-changing and diverse world. Design and implementation requires professionals to accommodate the needs of each student and focus on supporting the development of the whole child so that all students have equitable access to opportunities and support for maximum academic, emotional, social, and physical development.

Curriculum is not to be treated as fixed or rigid.

Curriculum should be dynamic, and educators should constantly analyze new data to make adjustments that meet the needs of all students in a dynamic world. Students are most successful when the curriculum (organization, instructional strategies, programs, structure, pacing) is based on their readiness, needs and interests (Orb, 2001).

Contemporary society is radically different in the 21st century. Because of these differences, curriculum requires standards-based, relevant tasks and engaging teaching strategies that complement contemporary students' needs in terms of the activities they will participate in during their lives and education beyond preschool-grade 12 learning. Because learning occurs in a global context, "educational systems must create a culture of inquiry and collaboration that enables all students and teachers to learn for their own sake and for the good of a culturally diverse democratic society in an interdependent world." (From *Principles for Learning: A foundation for transforming K-12 education* by ACTE, COSN, NCSS, NCTE, NCTM, and NSTA).

What is effective for *every* learner is a systematic and ongoing assessment of their needs and using the data in collaborative conversations with parents/guardians and educators in the interests of preparing the student to live and work in a global society.

Building a 21st-century curriculum

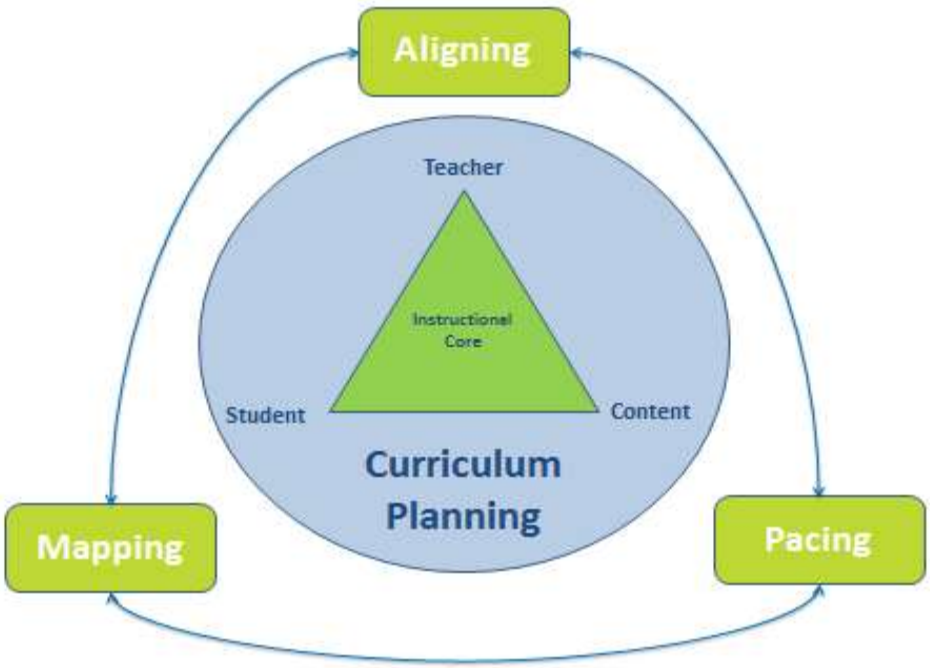
There are important principles of learning that should be incorporated in any curriculum. These principles recognize that learning in all disciplines is complex and individualized. Applying the core concepts within and outside of a discipline and understanding how to teach these concepts effectively is integral to these six principles.

1. Being literate is at the heart of learning in every subject area.
2. Learning is a social act.
3. Learning about learning establishes a habit of inquiry important in life-long learning.
4. Assessing progress is part of learning.
5. Learning includes turning information into knowledge using multiple media.
6. Learning occurs in a global context.

(*Principles for Learning: A foundation for transforming K-12 education* May 2010 by ACTE, COSN, NCSS, NCTE, NCTM and NSTA)

The school should develop and implement a curriculum that is rigorous, intentional and aligned with national, state and local standards and district requirements. Additionally curriculum planning should consider development, environment and other differences.

Curriculum planning maps the process through which the learning will occur. Understanding how the curriculum planning processes (aligning, pacing and mapping) are defined and the recursive nature of these processes will be helpful in communicating the need to continuously revisit them in order to rethink what is effective for *every* learner.



Curriculum Alignment is the process of interpreting learning standards and developing learning objectives that are directly targeted to the student (learning targets).

Curriculum Pacing organizes the **intended** curriculum for a particular subject area. The pacing guide usually offers a school year timeline of standards/targets to be learned as well as assessments of what is learned. The purpose of the pacing guide is to plan curriculum for the year in order to include all the necessary material to meet the subject-area standards.

Curriculum Mapping is a system that documents the design and delivery of curriculum, instruction and assessment for a course or grade level. Teachers record what was taught, when instruction was delivered, how instruction occurred, how instruction was assessed and how the results of assessment were utilized to improve instruction.

Think and Apply

Using the information about curricular planning, complete a "Here's What, So What, Now What" chart to help focus your school's next steps.

	Here's What this tells us	So What does this mean for our work	Now what do we need to do about it (plan of action)
Aligning			
Pacing			
Mapping			

Consider the key concepts under the headings "What should students learn" and "How will students experience learning" on the following two pages to guide your thinking.

THE CURRICULUM – *Ask yourself*: What should students learn?	
Key Concepts	**Promising Directions**
Standards **Skills and knowledge base expected of students for a particular subject area**	Using the Kentucky Core Academic Standards (KCAS) as a base, as well as the Kentucky Early Childhood Standards as the foundational step to the KCAS, integrate competencies that contribute to success, such as life and career skills, learning and innovation skills, and information, media and technology skills.
21st Century Skills (4 C's) • **Critical Thinking and Problem-Solving** • **Communication*** • **Collaboration*** • **Creativity**	Integrate 21st-Century Learning Skills including the "4 Cs" listed on the left which might also include learning and innovation skills, digital literacy skills, and career and life skills (**link to P21**).
Habits of Mind (as identified by Costa and Kallick, Alexandria: ASCD 2000) • **Persisting** • **Thinking and Communicating with Clarity and Precision*** • **Managing Impulsivity*** • **Gathering Data Through all Senses*** • **Listening with Understanding and Empathy*** • **Creating, Imagining and Innovation** • **Thinking Flexibly** • **Responding with Wonderment and Awe** • **Thinking about Thinking (Meta-cognition)** • **Taking Responsible Risks** • **Striving for Accuracy*** • **Finding Humor** • **Questioning and Posing Problems** • **Thinking Interdependently** • **Applying Past Knowledge to New Situations** • **Remaining Open to Continuous Learning**	Teach and model "Habits of Mind" which are dispositions that are skillfully and mindfully employed by successful people when they are confronted with problems, the solutions to which are not immediately apparent. (The Institute for Habits of Mind, 2011) *Items marked with an * in the column to the left have been identified as particularly difficult areas for deaf and hard of hearing students.
Life Skills & Career Readiness (P-21 link) • **Flexibility and Adaptability** • **Initiative and Self-Direction** • **Social and Cross-Cultural Skills** • **Productivity and Accountability** • **Leadership and Responsibility** • **Ethics**	Promote the development of student abilities to become competent, ethical, self-sufficient individuals in a global society.

ENGAGING LEARNERS – *Ask yourself*: How will students experience learning?	
Key Concepts	**Promising Directions**
Rigorous and relevant **Complex, real-world, inquiry-based learning that requires creativity, critical thinking and problem-solving.**	Teachers promote and support students' interests as they initiate complex, inquiry-based learning. Schools ensure: • flexible scheduling • extracurricular opportunities • project-based learning • problem-based learning • extended learning opportunities (e.g., work-based learning such as job shadowing, internships, cooperative education) • collaborative teacher planning • family and community engagement
Differentiation **A method of insuring continuous progress through which a specific, well-planned match is established between a student's abilities, interests, needs and curriculum opportunities.**	• Differentiated education experiences supplement, replace or extend learning beyond the standard curriculum. • Differentiation begins with pre-assessment to determine what students know.
Inter-disciplinary **Comprehensive integration of the curriculum by bringing together multiple discipline areas.**	• Teachers of various content areas and grade levels collaborate. • Principals provide flexible scheduling and resources to encourage collaboration.
Expanded/Extended Learning Opportunities **Those experiences outside the regular school schedule that expand learning**	Communities provide opportunities for: • service learning • internships/mentoring/shadowing/co-operative education • after-school programs • education enhancement opportunities • groups, clubs, organizations and co-curricular activities • language learning for new users of the English language, including some who are deaf or hard-of-hearing • incidental learning exposures critical for deaf students

The School Curriculum: Design and Review

Who might be involved in planning and/or reviewing the curriculum?

The following categories of stakeholders, reflective of the community being served, should be considered.

- Teachers
- Parents
- Administrators
- Community Leaders (i.e. business owners, city officials)
- Business and Industry Representatives
- Curriculum Specialists/Instructional Supervisors
- After-School Care Providers
- Early Childhood Professionals
- Library Media and Technology Specialists
- Higher Education
- School Councils
- Special Educators / Therapists / Tutors

Curriculum design and review is a continuous process. Flexibility when determining the detail of the design and shape of the curriculum is given to each school in the Commonwealth so the teaching and learning is meaningful and beneficial to the particular communities of learners. The design of each district/school's curriculum allows teachers to make interpretations in response to the particular needs, interests and talents of individuals and groups of students. While Kentucky's Core Academic Standards define the minimum content that must be taught, it is not a regimented curriculum.

In Kentucky, traditionally, districts have created a range of curriculum resources and components, ranging from pacing guides and maps to very detailed plans outlining specific instructional resources (books, articles, manipulatives), as well as specific common assessments for units and courses.

With the adoption of the Common Core State Standards in Kentucky (now called Kentucky's Core Academic Standards), all districts are facing the challenge of revising, editing or rewriting local curricula to reflect this content change. **The authors of the Common Core State Standards (CCSS) emphatically state that while the standards do define the content (or the WHAT), they do not prescribe HOW to teach or assess them. That is the function of the curriculum. Likewise, what is published on the KDE webpage as Kentucky's Core Academic Standards defines the WHAT. Local districts will need to define the HOW.**

Getting Started:

- ☐ Determine who may need to be a part of the curriculum conversation. See page 24 for suggestions in this resource. (The School Curriculum: Design and Review).
- ☐ Establish a team and set a schedule for planning face-to-face and/or virtually.
- ☐ Review and reflect as a team on the sections: Rationale for Revisiting Curriculum Planning beginning on page 9 and Planning a 21st-Century Curriculum beginning on page 18 of this resource to set the larger context for this work.
- ☐ Clarify the curriculum vision of the team using the team's responses to What is your vision for the Next-Generation Learner beginning on page 14 of this resource.
- ☐ Preview the Core Subjects and 21st-Century Themes section of this resource beginning on page 48. Note any information or resources that may need further research.
- ☐ Communicate the results of this preliminary committee work with the district/school staff on a regular basis.
- ☐ Begin by reaffirming the premise that *all* students are individuals and their learning may call for different approaches, different resources and different goals (*all* students can learn and succeed).
- ☐ Consider how to encourage and/or monitor the development of
    - relevance for students
    - conditions that help or hinder development
    - the effectiveness of approaches
    - how students demonstrate learning

Action Steps

The following **action steps** are adapted from the book *What Works in Schools: Translating Research into Action* by Robert Marzano. Bulleted items are suggestions for making the transition to Kentucky's Core Academic Standards by 2011-12.

Action Step 1: Identify and communicate the content essential for all students. Review the definition of curriculum alignment on page 21.

For 2011-12, the new Mathematics and English Language Arts standards ***must*** be implemented. There is no room for 'eliminating' any of the new standards as they are incorporated into state regulation: 704 KAR 3:303 (Required Kentucky Core Academic Standards).

- The Kentucky Core Academic Standards (KCAS) for English Language Arts contain specific standards for reading and writing in Science, Social Studies, and Technical Subjects, so those areas should be updated to reflect these new standards as well. *(Note: while new standards are being developed for science, social studies and more, they will not be ready for implementation in the 2011-2012 school year. Districts should continue to use the Program of Studies, 2006, for those until further notice.)*
- Consider decisions/policies of your local school board and school-based decision making councils regarding the content that should be taught to all students.
- Become familiar with the Kentucky Early Childhood Standards (KYECS) and their alignment to the KCAS in order to best support students as they transition from preschool to kindergarten, primary to intermediate, intermediate to middle, middle to high, and high to post-secondary.
- Review sample ELA deconstructed standards and math deconstructed standards. Continue work at the local level in deconstructing standards that are directly targeted to the student.

Updates needed to alignment including reading and writing in science, social studies, and technical subjects	**Policies/decisions for local board and SBDM consideration (e.g., writing policy)**	**Transition support (preschool-K, primary to intermediate, intermediate to middle, middle to high, high to post-secondary)**

Action Step 2: Ensure that teachers address the essential content.

- Use the Bookmarked Crosswalk for
  - ✓ Mathematics http://www.education.ky.gov/users/otl/CCDx/Mathematics_Bookmarked_Crosswalk_07192010_0226.pdf and
  - ✓ English/Language Arts http://www.education.ky.gov/users/otl/CCDx/ELA_Bookmarked_Crosswalk_07152010_1233.pdf
- Compare your current local curriculum document (district and school) to KCAS to determine if or where significant changes will need to occur. The gap analysis protocol will assist in this process.
- Begin to identify additional professional learning opportunities teachers will need to effectively deliver the new/revised curricula.

Comparison of the current math and ELA curriculum to the new standards	Significant changes needed to current curriculum (Gap Analysis)	Professional learning needs

☐ **Review the section Professional Learning in the 21st Century beginning on page 78.**

Action Step 3: Ensure that the essential content can be addressed in the amount of time available for instruction. Review the definition of curriculum pacing on page 21.

- Look at the collection of standards/other content determined locally for each grade level and organize it into chunks of learning based on topics.

- Determine the major chunks of learning, grade by grade, for an academic year. If curriculum pacing guides already exist, consider the alignment conducted in step 2 to ensure that any time adjustments necessary to incorporate new or different standards are made. Update curriculum pacing guides. Click here for sample pacing guides.

- Organize the set of *Learning Targets* by the courses/topics that have been identified grade by grade. Provide time for both horizontal and vertical grade level teams to discuss the standards and targets as chunks. Click here for sample deconstructed standards with learning targets.

Chunks of learning	Pace of instruction	Adjustments or new work to update pacing guides
	What supports do you have for students behind this pace, and what supports do you have for students ahead of this pace?	

☐ **Check out the information in the section, Implementing a 21st-Century Curriculum, beginning on page 32 of this resource prior to taking the next step. After reviewing, consider how a shift in thinking can enhance learning opportunities for students.**

Action Step 4: Sequence and organize the essential content in such a way that students have ample opportunity to learn it. Review the definition of curriculum mapping on page 21.

- Begin this process by considering the Kentucky Core Academic Standards (KCAS) and/or the Kentucky Early Childhood Standards (KYECS), then consider any local expectations the district sets for the students (see Action Step 3).

- Compare previously used curriculum maps with what has been mapped to the new standards. Consider what is already in place in terms of course or units. What can be kept? What needs to be adjusted? What needs to be added? If there are standards previously addressed by another grade level, what can be used that has already been developed?

- Discuss a system for documenting design and delivery of instruction for the purpose of continuous instructional improvement resulting in ample opportunity for learning.

Curriculum Maps	Units of Study/Lessons	System of Documentation

☐ **"How to Develop a Standards-Based Unit of Study"**

☐ **Review the 21st-Century Assessment section of this resource beginning on page 72.**

Action Step 5: Implementation and Delivery

- Identify the existing instructional and assessment resources that align well to the new curricula; identify those that do not.
- Consider the additional instructional materials and resources available that are needed to address the learning targets effectively.
- Incorporate other resources into the curricula as they are available (e.g., sample learning/assessment tasks aligned to particular standards/targets).
- Protect the instructional time that is available.
- Consider any policies or procedures that should be established to protect classrooms from unnecessary interruptions.
- Consider scheduling so that *all* teachers have regular opportunities to plan and reflect on their practice together. Examples could include common planning and communities of practice. Teachers of physical education, art, music, library media, guidance, special education and out-of school programs should be included.

Policies or procedures that affect classroom instruction	Collaborative planning opportunities	Time for reflection on practice

Action Step 6: Generate an action plan for ongoing reflection and revision of the curricula.

Reflect on the curriculum plan

Curriculum design begins with the premise that *all* students can learn and succeed and recognizes that as *all* students are individuals, and their learning may call for different approaches, different resources, and different goals.

A district/school's curriculum is well designed when:

- Students build on existing learning and attain higher levels of achievement.
- Students with special needs engage in quality learning experiences that enable them to achieve.
- Students with special talents and abilities engage in opportunities to work beyond formally described targets.
- Students' ultimate learning success is more important than covering particular achievement objectives.
- Principals and teachers define what they want students to learn and demonstrate how the curriculum is designed accordingly.

References and Resources

Beyond Proficiency @ your library (Kentucky School Library Media Guidelines) (http://www.education.ky.gov/NR/rdonlyres/DE492924-987A-4051-9E94-81583EB900EA/0/BPAUGUST2010.pdf)

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National Research Council (2001). *Eager to learn: Educating our preschoolers.* Committee on Early Childhood Pedagogy. Bowman, B. T., Donovan, S., & Burns, M. S. (Eds.) Commission on Behavioral and Social Sciences and Education. Washington, D.C.: National Academy Press.

Partnership for 21st Century Skills (P21 Framework) http://www.p21.org/index.php?option=com_content&task=view&id=254&Itemid=120

Sample Deconstructed Standards for English/language arts and math http://www.education.ky.gov/kde/instructional+resources/curriculum+documents+and+resources/

Sparks, S. D. (October, 22, 2010). "Science Grows on Acquiring New Language." *Education Week* [Online]. Available: http://www.edweek.org/ew/articles/2010/10/22/09window_ep.h30.html?tkn=QWMFQ40HYm6QDe1ol7LFckRjXvbnro2SQxu5&cmp=clp-sb-actfl [2010, November 22]

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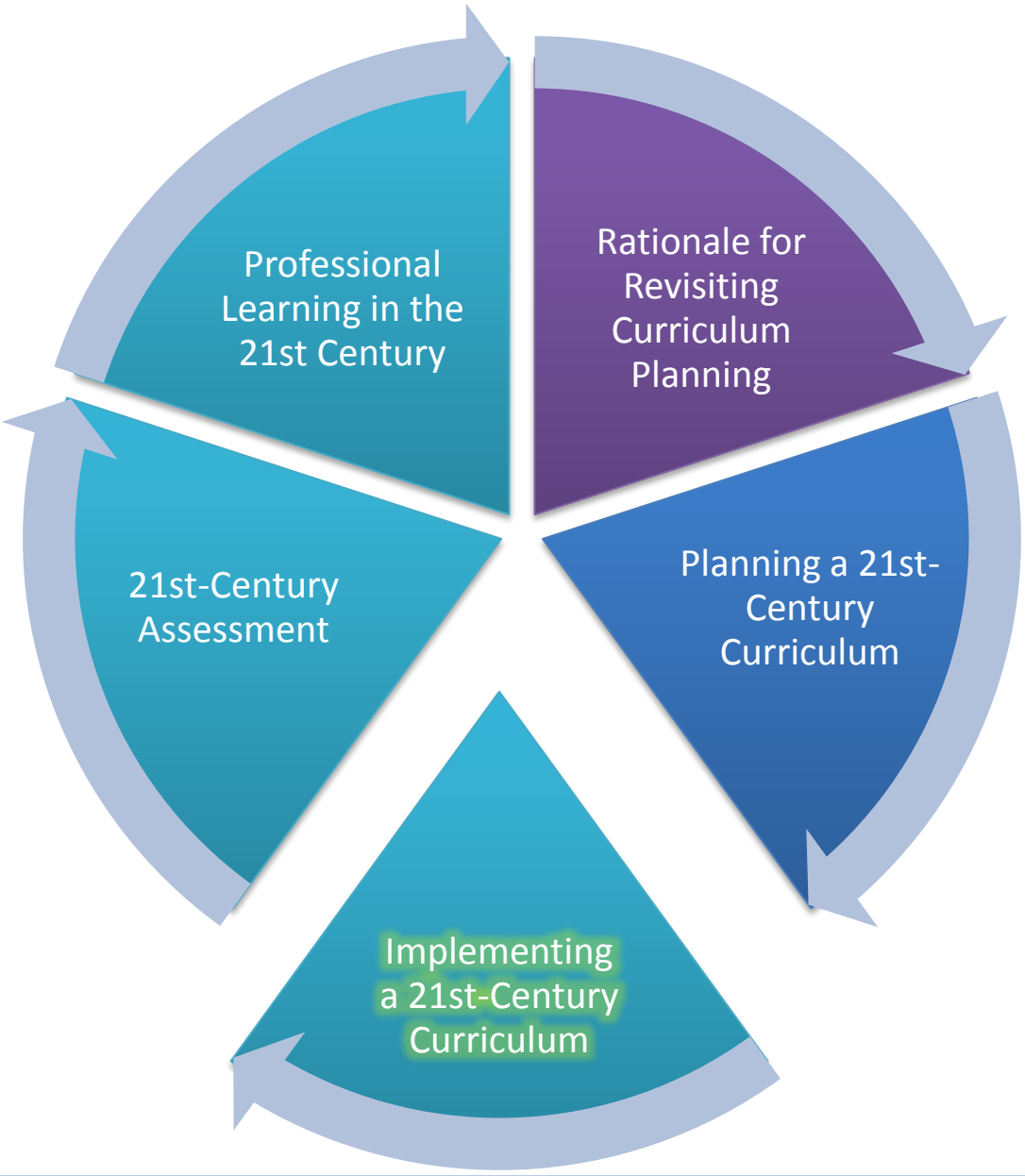


Inside this section:

- What comprises 21st-Century Teaching and Learning?
- Engaging Family and Community
- Core Subjects and 21st-Century Themes

What comprises 21st-Century Teaching and Learning?

Teaching and learning are the collaborative and reflective processes that promote success. The implementation of curriculum needs to accommodate every student and recognize the students' experiences and knowledge. A collaborative environment lends itself to leadership roles for teachers, families and community members allowing for a culture of shared responsibility. As progress, choices and actions are analyzed and evaluated, all stakeholders work together to determine that learning occurs.

> "Today's industrial-age, assembly-line educational model-based on fixed time, place, curriculum and pace-is insufficient in today's society and knowledge-based economy. Our education system must be fundamentally reengineered from a mass production, teaching model to a student-center, customized learning model to address both the diversity of students' backgrounds and needs as well as our higher expectations for all students."
>
> Wolf, Mary Ann, Report from the 2010 Symposium, *Innovate to Educate: System Redesign for Personalized Learning*

The intended curriculum becomes a reality through all stakeholders' deep understanding of what the outcomes of learning should be. Bringing learning to life through effective instructional practices and relevant learning experiences supported by school, family and community partnerships ensures that what is taught is actually learned.

All stakeholders must know, understand and assume a role in a personalized model of teaching and learning in the 21st century. A personalized learning model means that each learner will have someone in the family, school and/or community who can and will:

- help the student of today and tomorrow meet the expectations to be ready for life and career beyond high school
- access resources to help meet the individual needs of the student
- advocate for the educational rights of the student under Kentucky law and federal mandates such as the Individuals for Disabilities Education Act (IDEA)
- serve on committees, task forces, school-based decision making (SBDM) councils, parent organizations and advocacy groups to ensure a 21st-century learning environment is provided.

This commitment to a personalized learning model will support the knowledge jobs of today and tomorrow, which will require complex skills, expertise and creativity. Many of the jobs of the future do not even exist today. However, two essential skills will remain at the top of the list of requirements for 21st-century work: the ability to quickly acquire and apply new knowledge; the know-how to apply essential 21st-century readiness skills of problem-solving, communication, teamwork, technology use and innovation to every project.

Education should prepare students to:

- contribute to work and society by meeting needs and solving local and global issues and concerns
- engage in complex thinking and communicating
- exercise and develop personal talents throughout life
- contribute time and resources to fulfill civic responsibilities through informed participation
- create new services and new products by applying traditional knowledge and principles across other fields (innovation)
- blend traditions from a wide range of cultures to build a more harmonious, culturally rich and creative society
- manage demands for attention from many sources and apply critical thinking and information literacy skills to collaborative problem-solving, political action and community building

Students today have an expectation of learning approaches that are interactive, personalized, collaborative, creative and innovative. The questions for those engaged in curriculum conversations are:

- What *shifts in thinking* about instruction, assessment, accountability and professional development will be needed at every stage of learning to meet high demands on thinking and active use of knowledge?

- How do we prepare students for the future of work and careers that have not yet been invented?

Think and Apply

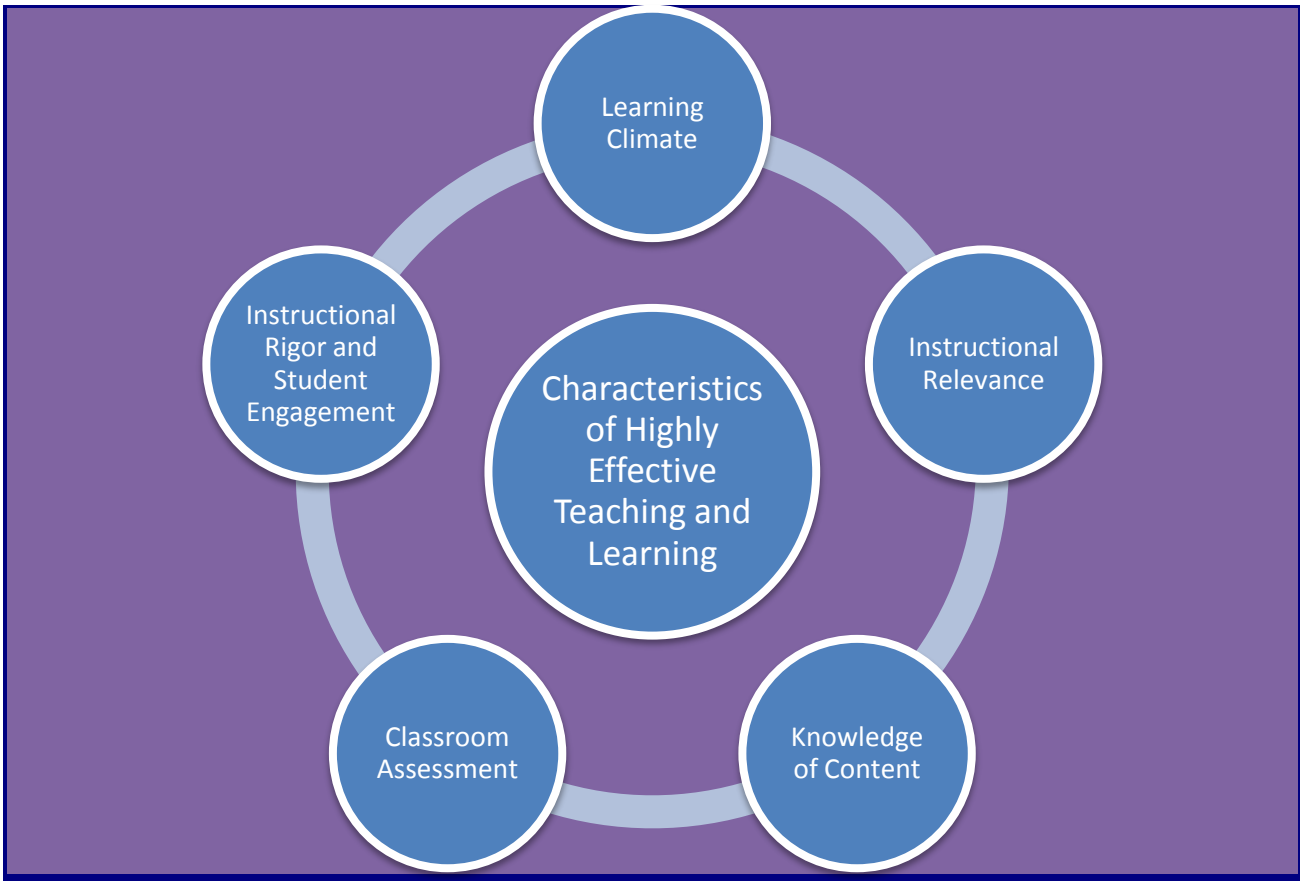
A Public Broadcasting System (PBS) special broadcast in February 2011, *Digital Media: New Learners of the 21st Century*, may help educators, families, and communities to jump-start the shifts in thinking required to address the educational changes needed to prepare the next generation for success in life and work.

These are examples of what comprises 21st-century learning. While viewing, note evidence of the following:

- questioning to discover answers
- identifying problems and inventing possible solutions
- designing and building a prototype
- learning for an authentic purpose
- collaborative small-group learning
- project/problem/design-based learning
- purposeful use of digital tools

Changes will continue to make new demands on education as the century progresses and highly effective educators will shift their practices to meet the needs of the student.

Characteristics of Highly Effective Teaching and Learning



Learning Climate: A teacher supports a safe environment in which high, clear expectations and positive relationships are fostered; active learning is promoted.

Classroom Assessment and Reflection: The teacher and the student collaboratively gather information and reflect on learning through a systematic process that informs instruction.

Instructional Rigor and Student Engagement: A teacher supports and encourages a student's commitment to initiate and complete complex, inquiry-based learning requiring creative and critical thinking with attention to problem solving.

Instructional Relevance: A teacher has the ability to facilitate learning experiences that are meaningful to students and prepare them for their futures.

Knowledge of Content: A teacher has understanding and application of the current theories, principles, concepts, and skills of a discipline.

Providing Sufficient Opportunities to Learn

21st-century teachers must provide sufficient opportunities for students to learn. In order to do this, teachers must understand *who* their students are, gauge their needs as learners, design instruction that meets students where they are and respond appropriately to the outcome of instructional delivery.

Teacher Behavior	Related Knowledge, Skills and Competencies
Understanding Students	• **Diverse Students** Diverse students with unique educational needs can include students with disabilities, students from racial and ethnic minorities, students from migrant or immigrant families, and non-native speakers. Additionally, all students can face gender-based challenges to reaching their educational potential. Acknowledging that students are diverse in their backgrounds and abilities simultaneously acknowledges that a one-size-fits-all approach cannot succeed for all students, but that it is possible for all students to meet high standards. • **Cultural Responsiveness** Teachers can meet the needs of diverse learners through culturally responsive instruction. Culturally Responsive Instruction builds on students' cultural knowledge to enhance academic success. Teachers must develop cultural competencies— skills related to awareness of issues of culture, language, race, disability (e.g., deaf culture) and ethnicity—to successfully utilize culturally responsive instruction. • **Creating a Supportive Learning Environment** Educational researchers such as James H. Stronge have found that creating a supportive learning environment is critical for effective teaching and learning to occur. When creating a supportive learning environment, teachers convey a sense of immediacy, credibility and caring, and they communicate to students in both verbal and non-verbal ways that are essential to cultivating a positive and productive learning community • **Digital Natives** 21st-century students are digital natives; they were born during a time when the Internet and mobile communication devices were the norm. Most students are "plugged in" to a technologically sophisticated world outside of schools. Teachers of digital natives must find ways to deliver instruction that capitalizes on technology. Multimedia Transformation-How Digital Tools Are Connecting Teaching and Learning

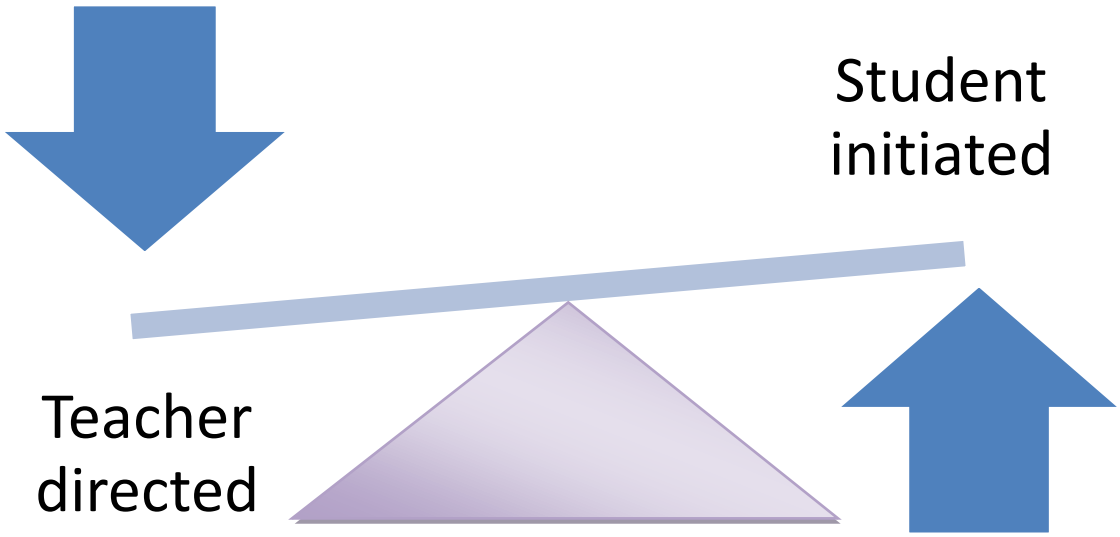
Instruction to Meet Students' Needs	• **Making Connections to Prior Learning and Experiences** Students learn more effectively when they already know something about a content area and when concepts in that area mean something to them and to their particular background or culture. When prior knowledge is activated, instruction is infused with purpose through the student's interest and curiosity. Prior knowledge acts as a lens through which we view and absorb new information. It is a composite of who students are, based on what they have learned from both academic and everyday experiences. (Kujawa and Huske, 1995) Teachers who link instruction to prior knowledge build on students' familiarity with a topic (Beyer, 1991) and enable students to connect the curriculum content to their own culture and experience. • **Universal Design for Learning (UDL)** Universal Design for Learning (UDL) is a curriculum designed approach to increase flexibility in teaching and decrease the barriers that frequently limit student access to materials and learning in classrooms (Rose & Meyer, 2002). UDL is based on research in the learning sciences, including cognitive neuroscience that guides the development of adaptable learning environments to accommodate individual learning differences. Within this framework, universal design principles are applied to instructional materials, curricula and educational activities so that they are achievable and challenging for students with a wide range of abilities and needs. Universal access to learning includes captioning what is said in the classroom with voice recognition software, sound field systems, acoustically appropriate design and more. • **Differentiation** Differentiated instruction is a process of teaching and learning for students of differing abilities in the same class. To differentiate instruction is to recognize students' varying background knowledge, readiness, language, preferences in learning and interests and to react responsively. The intent of differentiating instruction is to maximize each student's growth and individual success by meeting each student where he or she is and assisting in the learning process (Tomlinson 2001). • **Teaching as Inquiry** Teaching as inquiry is a learning process through questions generated from the interests, curiosities, and perspectives or experiences of the student. Inquiry-based learning is often described as cyclical, beginning with the formulation of a question, followed by investigation, creation of a solution or an appropriate response, discussion and reflection in connection with results (Bishop et al., 2004). Student-centered and student-led, the purpose is to engage the students in active learning, ideally based on their own questions. Learning activities are organized cyclically, independent of the subject. Each question leads to the creation of new ideas and other questions.

	• **Hybrid Models/E-learning** Hybrid instruction refers to a blending of both traditional classroom instruction and online learning activities. Combining the best of both styles of instruction, hybrid instruction allows students to make a meaningful connection with their instructors, as well as other students, and have flexibility of when and where the learning occurs.
Responding Appropriately to Instructional Delivery	• **Encouraging Reflective Thought and Action** "The connection between experience, reflection, making meaning, and learning is clear. Reflection is an essential part of the learning process because it can result in extracting meaning from the experience. Participants who reflect on an experience are better able to extract lessons from the experience, to understand themselves in relation to the experience, and to apply the learning to other areas of their lives" (*Reflective Practice* Sugarman et al 2000). • **Intervention** An intervention is an educational practice, strategy, curriculum or program. (US Department of Education) The Kentucky System of Intervention (KSI) Guide provides resources to help schools and districts analyze their current systems (human, physical and financial resources and materials) and refine their decision-making processes and procedures to move forward toward full implementation of a *comprehensive instructional system.* KSI is a comprehensive system for meeting the needs of all students by ensuring preventive measures for learners who struggle, as well as enrichment for those learners who surpass grade-level expectations and need extended learning opportunities. KSI encompasses Response to Intervention, accelerated learning requirements, closing the achievement gap, high-quality instruction, readiness to learn, and student transition. Response to Intervention is a tiered structure for early identification of learners who struggle academically or behaviorally and provides a means for Immediate intervention.

Educators, families, communities and policymakers require a clear vision of what students need to learn to be successful.



Instructional Delivery: Achieving Balance



Developmentally appropriate teaching practices provide a balance of student-initiated and teacher-directed experiences. The teacher in high quality programs takes responsibility for directing, stimulating and supporting the learning experiences each student needs. Teachers who shift their practices to meet the needs of our times are balancing the coverage of content with the discovery of ideas and concepts. They are working to achieve a balance of presentation and explanation with guidance and support of research, discovery and sharing by the learner of their own findings in learning projects. For students to achieve competence in any subject area means developing ***both*** the knowledge ***and*** the skills to apply the knowledge to the kinds of questions and problems experts in that field would tackle. Instead of thinking instruction must be either teacher-directed or student-initiated to be effective, consider these examples of ***both/and*** thinking that achieve the needed balance of the two.

Students:

- *both* constructing their own learning *and* benefitting from teacher instruction
- benefitting *both* from engaging in self-initiated *and* from teacher-planned and structured activities and experiences
- benefitting *both* from learning experiences that challenge them *and* from opportunities that allow the practice of new skills

Teachers:

- *both* having high expectations for all students and supporting student-initiated opportunities *and* recognizing that all learners may at times need additional assistance and resources
- committed to *both* closing the achievement gap *and* providing what each student needs for school success

(*21st Century Skills: Learning for Life in Our Times*, Trilling and Fadel, 2009)

Learning Environment

In the 21st century, learning environments should be seen as the support systems that accommodate the unique needs of every student and support the positive human relationships needed for effective learning. Twenty-first century teachers understand and respect diversity, realizing that what learners bring to the classroom culturally, ethnically and through language are assets to be leveraged. By providing a supportive learning environment, teachers ensure academic as well as emotional, social and physical development.

Such development happens in classrooms, but it also takes place beyond the school walls. Teachers recognize the importance of student experiences outside the classroom and embed connections to those experiences in instruction. Additionally, teachers acknowledge the developmental learning level and habits for each individual student and understand that students need safe and supportive learning environments to thrive.

Relationships and Resiliency - Learning environment includes not only place and space, but the relationships that create a positive environment which supports every student's development. The literature on resiliency (Richardson, 2002; Rutter, 1999) asserts that even students who experience multiple significant risk factors may be resilient and ultimately successful in life if even one adult invests in them, holds high expectations for them (i.e., values them and believes in their potential) and maintains a consistent supportive relationship over time. Relationships are extremely important protective factors. Additional critical protective factors (social competency, problem-solving skills, self-esteem, and sense of purpose and future) are attributes which can be effectively developed or strengthened with coaching, guidance and support in the context of a positive learning environment (See SEARCH Institute website). Ultimately, relationships are as important to the learning environment as rigor and relevance (McNutly and Quaglia, 2007)

School Climate and Barriers to Learning - It is critical that educators establish and maintain a positive context that facilitates learning. School and classroom culture and climate impact important factors for learning such as engagement, behavior, self-efficacy, achievement and social- emotional development. The optimum learning environment is one of high expectations and low stress.

A positive learning environment is especially critical for at-risk students, due to factors like poverty, disability or abuse. If schools become a source of significant additional daily stress for students (e.g., over-demanding, overwhelming, full of opportunities for failure, over-controlling, non-supportive, boring, hostile or bully-ridden), students cannot learn. Neither can they grow or progress through life's

typical developmental stages and challenges, particularly in adolescence. The reality is that negative and stressful learning environments can themselves become barriers to learning (Adelman and Taylor, 2006; National School Climate Council, www.schoolclimate.org).

Engagement and Motivation – Motivation is a pre-requisite for attentiveness, involvement, learning and performance. In the context of a positive school climate, successful teaching mobilizes the student to engage in learning. Lack of academic or social engagement in school is a key factor predictive of dropping out (Rumberger, 2004). According to a study conducted by UCLA, "Increasing intrinsic motivation requires focusing on students' thoughts, feelings, and decisions. In general the intent is to reduce negative and increase positive feelings, thoughts, and coping strategies" to enable active learning and motivated student performance (Center for Mental Health in the Schools-UCLA, p. 80-81, http://smhp.psych.ucla.edu).

Learning environments must be perceived as caring, supportive places which offer activities that are valued and challenging, but doable. Motivation theory and research says that learners must both value an activity and expect that they will be able to successfully complete it if they are to attempt the task and expend substantial amounts of energy and the effort often necessary for learning.

Therefore, schools must carefully consider factors like the perceived relevance of content, fear of failure in the face of rigor, cultural competence of educators, peer climate for embarrassment, learning problems, emotional distress and other elements which affect student perceptions, values and expectancy. Students maintain expectations for success based on recent and historical school experience. High teacher expectations and rigorous learning activities also require high levels of scaffolding and personalized support to enable success for all. Protheroe suggests that "Reluctant learners must be both challenged and supported if they are to develop the self-efficacy they need to take the kind of risks required to learn and succeed." (Protheroe, N., "Motivating Reluctant Learners," Principal, Sept-Oct 2004, www.naesp.org).

Teaching and the Challenges of 21st-Century Life – Teachers must not only meet students where they are, but anticipate the kind of life and career skills that will be necessary to meet the challenges of the future. This includes anticipating the effects and importance of unintended influences which result from a 21st-century world. Despite obvious progress, the 21st-century way of life also includes rapid pace, greater complexity and information development, which potentially precipitate work and activity overload, sleep deprivation, higher rates of anxiety and depression, sedentary lifestyles, obesity,

constant digital/virtual connections, the tyranny of immediacy, underdeveloped relational skills, little time to reflect, and a large dose of narcissism in our youth (Elmore, 2010; Kadison and DiGeronimo, 2004).

In addition to commonly cited 21st-century skills like creativity, flexibility and initiative, students will likely need additional skills in critical thinking, problem-solving, time and self-management, prioritizing, digital wisdom, distinguishing the important from the trivial (e.g., because my cell phone just beeped, it seems vitally important /urgent because it's immediate), valuing, self-awareness, reflection skills, and coping skills for dealing productively with multiple competing life opportunities and demands.

Teaching Social and Life Skills – Adequate preparation for 21st-century lifestyles will necessitate more attention to social interaction, coping, self-management and ethical decision making skills (Cohen, 2006; Goleman, 2006). Effective schools and teachers promote social-emotional learning and well-being by intentionally integrating social-emotional learning into the planned curricula, as well as by explicitly teaching and coaching these skills in the context of the natural opportunities related to students' lives and in the ongoing transactions of each school day (e.g., responsibility and integrity, social interaction and relationship skills, self-regulation, health and safety behaviors, anger management, frustration and coping skills to handle stressors).

Structure and Supports for Learning – Structure in school must be viewed as the type of support, guidance and direction provided to the student as well as the daily learning activities and agenda for instruction. The type and degree of structure and support should vary to match the needs of the student. The level of structure is effective if the result is student confidence, motivation and success in academic/social learning. A variety of teaching and learning strategies now exist for assisting students who struggle to read, write, calculate, process information and behave appropriately. When teachers work together in professional learning communities and routinely review performance data, they have opportunities to learn and discover when/ how to use differentiated learning strategies to support diverse students.

Positive Behavior Support – Many students need explicit instruction in social skills and behavior. Instructional approaches to discipline (www.kycid.org; www.pbis.org; www.safeandcivilschools.com), when implemented with fidelity school-wide, provide the structure and skills needed to explicitly teach responsible behavior. By providing positive behavior support to all learners (which includes planned teaching of positive behavior skills and expectations, modeling, practice and feedback, review and

reinforcement), schools can decrease disruptions, increase academic engaged time, improve the positive climate of the school and equip all learners with the social interaction skills needed for success in life and the workplace. These approaches focus on the long-term development of pro-social behavior and intrinsic motivation versus an overreliance on external control.

Think and Apply

Think-Write-Pair-Share

Think back to a learning experience that presented difficulty for you.

What made your learning experience easier? How did a significant adult or organization ensure you felt safe as you were learning?

Place a check by the factors below that influenced your ability to overcome the difficulty. **Write** your ideas about why or how these factors were helpful.

	Relationship
	Resiliency
	School Climate
	Barriers to Learning
	Motivation
	Engagement
	Relevance
	Social and Life Skills
	Structure and Supports for Learning
	Positive Behavior Supports

In **pairs**, **share** your response.

What additions, shifts or modifications must be made in the learning environment(s) in your district/school(s) to match the needs of 21st-century learners?

Engaging Community and Family

Connections between schools and the multiple resources that exist in a community to improve outcomes for students can promote a shared accountability between schools and community providers. Engaging community and family resources involves utilizing community resources, developing strong family and school connections, and fostering community partnerships. Effectively engaging community and family resources is critical to school success. According to the National Parental Information and Resource Center, "Research over the past 30 years has shown that engaging families in their children's education increases student achievement and decreases dropout rates. Effective family engagement is not a one-time program or the choice of a good school, but rather a set of day-to-day practices, attitudes, beliefs and interactions that support learning at home, at school, afterschool and during the summer. To ensure that the students of today are ready for the careers of tomorrow, families, schools, and community groups need to work together to promote engagement that is systemic, sustained, and integrated into school improvement efforts" (www.nationalpirc.org/engagement).

COMMUNITY RESOURCES	
Key Concepts	**Promising Directions**
Schools refer families to agencies and organizations to promote a comprehensive system to better serve the students in local communities. Often these resources help to remove barriers to learning and achievement. <u>Possible Community Resources</u> • Health and Welfare Agencies • Family Court • Public Libraries • Housing Authority • Faith-Based Organizations • Boy/Girl Scouts • Head Start • United Way • YMCA • Boys Club—Big Brothers/Big Sisters • Girls, Inc. • Urban League • Arts Organizations • Governmental Agencies • Advocacy Groups	• Schools utilize community resources (e.g., Community Education, Family Resource and Youth Service Centers) to meet basic needs of students and families. • Community resources increase parent involvement in the educational process. • When appropriate, schools provide access and referrals for families to a variety of community resources. Family Resource and Youth Service Center (FRYSC) directors, community education directors, KY Head Start Association family advocates, child care resource and referral agencies and County Extension agencies often serve as the liaisons between families and community resources.

FAMILY AND SCHOOL CONNECTIONS	
Key Concepts	**Promising Directions**
Family is identified as the adult(s) responsible for the child's education. This could include but is not limited to: a parent, guardian, grandparent, caregiver, after-school provider, or other relative.	• Educators develop reciprocal relationships with all families through home visits, parent/child activities, family involvement activities within or outside of the school facility and direct/indirect communications. • The school has a system to track communication with a child's family. • The student is included in the communication with the family and school when appropriate. • School culture promotes positive family/school relationships. • Teachers create and maintain "positive, interactive relationships with families as they participate in the education of their children." (www.nbpts.org). • The school recruits and trains family members as volunteers. • Training is provided to families, emphasizing working with their children at home, parenting skills and family literacy. • Understand that parent involvement changes as the child progresses from elementary to middle to high school. • Community education and adult education services are made available to family members.

The Missing Piece of the Proficiency Puzzle-Recommendations for Involving Families and Community in Improving Student Achievement , published in June 2007 by the Kentucky Education Commissioner's Parent Advisory Council (CPAC), is a comprehensive performance tool for assessing how well schools engage families and communities in the educational process. Specific school-level descriptors for novice, apprentice, proficient and distinguished performance are outlined for six objectives: relationship building, communications, decision-making, advocacy, learning opportunities and community partnerships. The language of the descriptors offers direction and guidance for improving the school, family and community connection so vital to students for success in learning and in life.

COMMUNITY PARTNERSHIPS	
Key Concepts	**Promising Directions**
Schools engage in collaborative approaches by working jointly with community partners to better serve children through creating mechanisms to enhance services.	• Community partners are included in needs assessments of local areas to make recommendations for school improvements. • Community partners may help with creating extended learning opportunities for students. This could include creating physical spaces that are flexible and adaptable, enabling collaboration, interacting and sharing information. • Groups such as coalitions or advisory councils exist to enhance student learning opportunities and to galvanize all who support learning in the school and community. • Schools seek business and industry involvement for career readiness, internship/shadowing opportunities and development of industry certificates through community education directors, Service Learning grants, Family Resource and Youth Service directors, adult education directors, Kentucky Coalition of School Volunteer Organizations, Kentucky Workforce Investment Boards (KWIB) and 21st Century Community Learning Centers • School personnel (e.g., community education directors, Title I coordinators, Family Resource and Youth Service Center directors) could help coordinate community engagement with the schools.

The following webinars may be helpful in learning more about engaging families and the community.

Achieving Excellence and Innovation in Family, School and Community Engagement
Transforming Schools through Family, School and Community Engagement

Students who participate and contribute in communities have a sense of belonging and confidence. They understand the importance of balancing rights, roles and responsibilities. They understand how they can contribute to the quality and sustainability of social, cultural, physical and economic environments.

Think and Apply

Divide your team into three groups. Assign each group one of the following topics: Community Resources, Family-to-School Connections and Community Partnerships. Each group will create a list of possible **implementation activities** for each of the Promising Directions listed in the charts above and on the preceding pages. Share lists with the larger group. Consider adding these activities to curriculum maps and/or Comprehensive District/School Improvement Plans.

Core Subjects and 21st-Century Themes

Important for understanding the impact of the four forces on the learning of the next generation-the students of today

For students to succeed, their natural inclination to learn must be systematically supported and actively engaged, creating the foundation for 21st-century skills which encompass problem solving, effective communication, collaboration and innovation. The 21st-century readiness skills associated with information, media and technology make cognitive demands that require capabilities in a wide variety of cognitive tasks.

Prensky writes that "Digital wisdom can be, and must be, learned and taught. As we offer more courses in digital literacy, we should also offer students guidance in developing digital wisdom. Parents and educators are digitally wise when they recognize this imperative and prepare the children in their care for the future- educators by letting students learn by using new technologies, putting themselves in the role of guides, context providers, and quality controllers, and parents by recognizing the extent to which the future will be mediated by technology and encouraging their children to use digital technology wisely." (Prensky, 2009)

The core subject area statements that follow describe how knowledge work, digital lifestyles, thinking tools and learning research (the four forces) are changing the delivery of instruction. Curricula that addresses the needs and interests of the next-generation learner must refer to the powerful forces cited previously. The integration of 21st-century themes (global awareness; financial, economic, business and entrepreneurial literacy; civic literacy; and health literacy) and the four Cs (creativity and innovation, critical thinking and problem- solving, communication and collaboration) along with an increasing amount of available data will enhance the ability to create, interpret and evaluate. District/school curriculum planning teams are then able to:

> "'If we teach today's students as we did yesterday's, we are robbing them of tomorrow."
>
> John Dewey

- match the standards to the curriculum which has considered the knowledge work needed for success in a knowledge economy
- initiate conversations with out-of-school partners and parents in the design of programs to assist in addressing multiple standards
- make those links between and among learning areas leading to units of study using learning research around authentic learning, mental model building, internal motivation, multiple intelligences and social learning
- provide authentic experiences using the thinking tools (technology, digital devices, services) of our time with learners engaged in a digital lifestyle
- prepare learners for meeting the challenges of the 21st century

While the subject areas are presented as distinct in the following pages, this should not limit the ways in which districts/schools structure the learning experiences offered to students. All learning should make use of the natural connections that exist between subject areas and the links that can be made to the 21st-century readiness skills.

Arts and Humanities

Knowledge Work

Business leaders ranging from major international corporations to state and local businesses require workers who have the ability to communicate, collaborate with others and think critically and creatively. Students deeply engaged in the arts have learned and developed these 21st-century skills for many years. In a standards-based arts class, students naturally develop the soft skills required to become college- and career-ready:

- work independently as well as a part of a group
- solve problems in innovative and creative ways
- adapt to new solutions as their work evolves
- develop self-confidence and the ability to take initiative and responsibility

Digital Lifestyles

Learning through the arts encompasses communicating through a variety of means. Students learn to read visual representations of situations as well as to create visual representations of their own; to create musical works or choreograph dances to express their views; and to create dramatic representations of their views. Students learn to utilize technological means of producing their art works along with traditional methods and combinations of the two. Students learn to utilize technology for research and to give and receive critical feedback on their work, the works of their peers and the work of professionals.

Learning Research

According to the National Standards in Arts Education, the arts have been a part of mankind from the very beginning. Nomadic people sang and danced, hunters painted their quarry on the walls of caves, parents acted out stories of heroes for their children. In sum, the arts have described, defined and deepened human experience.

In the 21st century, arts education benefits both students and society in specific ways. It benefits the student by cultivating the whole child, building many kinds of literacy while developing intuition, reasoning, imagination and dexterity into unique forms of expression and communication. Arts education also helps students by introducing them into a variety of ways of perceiving and thinking.

The arts benefit society by providing students with powerful tools for understanding the human experience, for learning to adapt to and respect others' ways of thinking, for creative modes of problem-solving, for thinking critically and for communicating and working collaboratively with others.

Research has shown that "Intensive involvement in the arts associates with higher levels of student achievement and college attainment, and also with many indications of pro-social behavior such as volunteerism and political participation. [...]English language learners [which may include students who are congenitally deaf] benefit from arts-rich schools in unique ways. [...]Arts-rich schools are seen to bear characteristics including a climate for achievement as well as instructional practices that may account for their advantages." (Catterall, James S., *Doing Well and Doing Good by Doing Art*. 2009)

Example of the influence of Community Partnerships on Education:

The video linked below was part of an after-school program at Louisville Central Community Center. It has a strong health message for youth, and upon seeing it, Kentucky's First Lady Jane Beshear sent it to America's First Lady, Michelle Obama. Faculty artists included JouJou Papillier, filmmaking, and Safiyyah Rasool, choreography.

Sequence 1 HEART MV H 264 Youtube

English/LA

Knowledge Work

Knowledge of language is fundamental to literacy learning in 21st-century society. As students work to create meaning from all types of print and non-print text, they need opportunities to increase their knowledge and improve their ability to process knowledge. Because knowledge is dynamic, 21st-century literate students need to be able to locate, evaluate, synthesize and effectively manage multiple sources and forms of information concurrently, independently and collaboratively.

Digital Lifestyles

According to the National Council of Teachers of English/LA, all students in the 21st century should have experience with and opportunities to develop skills around technological tools used in the classroom and the world around them. Students need to be taught how to access, use and evaluate tools appropriate to their tasks. Twenty-first century learning necessitates creativity, collaboration, critical thinking and communication; digital lifestyles will require learners skilled in connecting the four Cs. Teachers and parents are in unique positions to learn from and with their students as they collaborate, create, think critically and communicate within and beyond the school walls. As Kentucky moves toward more collaborative communications, digitizing communication collections will become more important. For example, collections may include performance events, podcasts and the use of Google Docs for collaborative projects and leadership. Digital lifestyles will incorporate text interpretation, captioning, spoken description and other means to allow *all* learners to fully utilize these collections.

Learning Research

A shift in mindset is required to prepare our students for literacy learning in the 21st century. Authentic learning requires opportunities for independent thinking , collaborative exploration of ideas and the connecting knowledge in all subjects. Rather than skill and drill, learning opporunities need to allow space for the curiosity and creativity that lead to innovative thinking. Students should have opportunities to choose texts, projects and communication tasks that meet their needs as learners and that build their internal motivation as they focus on the learning rather than on the grading.

See the following teacher example that demonstrates authentic learning with technology.

Shanna Patton, AP Language / English Teacher, Scott County High School

Multiple Technology Applications

My goal is to integrate what students learn about how to effectively use technology into the curriculum so it enhances content and becomes a seamless part of the learning. Here are some ways my students use technology in my classes:

- Use my online classroom site where students access announcements and links to assignments, forms and relevant websites.
- Receive immediate feedback and track data using the Clicker Response System for daily ACT questions.
- Play games on Study Island to reinforce English and reading skills which is also useful for individualized interventions and supplemental tutoring. Use Study Island and Florida Virtual School programs for ACT and AP English Language exam review.
- Share student exemplars and real-time peer editing using an Elmo Document Camera and a classroom projector. Once the process is modeled, students use these tools and lead the discussions.
- Use Prezi online presentation software for projects. This software is like PowerPoint on steroids and can be accessed from anywhere internet connection is available.
- Engage in online research regularly to compose a current events journal. Use this research and journal in a current event debate each Friday. This strategy has the added benefit of allowing frequent opportunities to develop ability to form and articulate arguments.
- Analyze released exams and sample student responses found at the AP Central website.
- Engage in an online discussion with peers on the AP Blog by posting comments and questions about literature.
- Start the year with a rhetorical device of the day. This site allows students to access and review rhetorical devices in sound and video clips. http://www.americanrhetoric.com/rhetoricaldevicesinsound.htm
- Find sources for college-level writing assignments using online research databases (EBSCO, ERIC, NewsBank, etc.)
- Create pages for characters, etc. using Facebook and use the MovieMaker program as part of class work.
- Create and post video assignments using You Tube.
- Research and create webquests, which are then completed by their peers.

Mathematics

Knowledge Work

Solving novel problems, approaching circumstances with a mathematical perspective and collaborating with others to creatively solve problems is a part of every mathematical experience. This starts in very early childhood as children play and explore puzzles, blocks and other tangible items, allowing them to develop one-to-one correspondence, understanding of parts of a whole, sorting items by various attributes and other early concepts of mathematics. Mathematics can be defined as a study of patterns and relationships, a way of thinking, a language, using carefully defined terms and symbols, and a tool. The 21st-century challenges students to be mathematically literate, well-prepared for ever changing technology and growing global competition. New knowledge, tools, and ways of doing and communicating mathematics continue to emerge and evolve. With a greater emphasis on conceptual understanding, mathematics can support decision-making and critical thinking. For example, understanding graphs and percentages can help a student interpret a political candidate's views on climate change or the budget deficit. With the blinding pace of change, students who learn to think mathematically and think mathematically to learn will have significantly enhanced opportunities and options for shaping their futures.

Digital Lifestyles

Mathematics is a science of concepts and processes that have pattern of regularity and logical order. Students will eagerly apply and use mathematical concepts if offered relevant, interesting experiences that engage them in the 21st century. The technology that will be available to students five or ten years from now is unknown; however, with current technology, students can perform the skills listed. This is not an exhaustive list. Other examples can be found at http://www.p21.org/images/stories/matrices/ictmap_math.pdf

- Use digital cameras to photograph representations of geometry concepts from their surroundings.
- Create graphical representations of data using graphing calculators and spreadsheets.
- Use graphing calculators and probes to collect and analyze environmental data.
- Use online bulletin boards to engage in discussions of math concepts with other people from around the world.
- Formulate, approach and solve problems beyond those studied using a variety of problem-solving tools such as smart phones, calculators, probes, GPS and geometry tool software.
- Use presentation software to share their problem-solving strategies.
- Create products using technology to apply mathematics.

- Use technology to develop creative solutions to mathematical problems.
- Use technology to illuminate mathematical situations and interrelationships among other disciplines

Learning Research

To learn and truly understand mathematical skills and concepts, students should reach mathematical proficiency through conceptual understanding, procedural fluency, strategic competence, adaptive reasoning and productive reasoning (*Adding it Up: Helping Children Learn Mathematics*, 2001). These five strands of mathematical proficiency are interwoven and interdependent as students fully develop their mathematical understanding.

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students (http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf). These practices rest on important "processes and proficiencies" with longstanding importance in mathematics education.

Mathematically proficient students in the 21st century are sufficiently familiar with tools appropriate for their grade or course. They make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. For example, mathematically proficient high school students analyze graphs of functions and solutions generated using a graphing calculator. They detect possible errors by strategically using estimation and other mathematical knowledge. When making mathematical models, they know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data.

Mathematically proficient students at various grade levels are able to identify relevant external mathematical resources, such as digital content located on a website, and use them to pose or solve problems. They are able to use technological tools to explore and deepen their understanding of concepts (Common Core State Standards for Mathematics, 2011)

A solid mathematics education in the 21st century is essential for an informed public, our national security, a strong economy and national well-being.

Practical Living/Career Studies

Knowledge Work

In the past, academic skills and career/workplace skills have been seen as two separate entities. This has changed as the economy has become global rather than regional. Businesses want workers with lifelong learning skills.

Practical Living (PL) introduces students to areas of concentration, which include:

- Personal Wellness
- Nutrition
- Safety
- Psychomotor Skills
- Lifetime Physical Wellness

For career studies (CS), the Southern Regional Education Board's publication *Ready for Tomorrow*: *Six Proven Ideas to Graduate and Prepare More Students for College and 21st-Century Careers* states that "technical skills alone are not enough for today's workplace. Employees need to be able to use their minds *and* their hands on the job." CS equips all students with 21st-century skills through real-world and work-based learning, as well as authentic strategies. Areas of concentration include:

- Consumer Decisions
- Financial Literacy
- Career Awareness / Exploration and Planning
- Employability Skills
- Communication and Technology

These content areas ensure students have multiple opportunities throughout all grade levels to acquire skills and concepts linked to career and personal growth competencies. PL/CS also allows students to successfully develop soft skills that teach how to effectively communicate and collaborate with others, problem-solve, think critically and develop as leaders.

Digital Lifestyles

With the ever-changing world of technology, students need to utilize and hone their proficiency in today's digital home, workplace and community. PL/CS infuses 21st-century technology with the application of knowledge and skills that are necessary for success in the 21st-century workforce. Today's digital tools are many and varied and can effectively educate students how to safely be connected to today's digital society.

Learning Research

In a 2006 report for the Gates Foundation, 81 percent of respondents said that more learning opportunities that make the classroom relevant to the real world would have helped them finish high school by seeing the connection between school and the workforce. Students say they lose interest and motivation in education because the curriculum does not have a contextual, real-world application.

Career and technical education (CTE) significantly contributes to increasing the persistence to graduation rate. Schargel and Smink (2001) have identified five potential benefits of CTE to at-risk students:

- enhancement of students' motivation and academic achievement
- increased personal and social competence related to work in general
- a broad understanding of an occupation or industry
- career exploration and planning
- acquisition of knowledge or skills related to employment in particular occupations or more generic work competencies

The National Research Center for CTE reported in 2007 that CTE students were significantly more likely than their non-CTE counterparts to report that they had developed problem-solving, project completion, research, math, college application, work-related communication, time management and critical thinking skills during high school (Lekes, N., et al).

For many students, applying academic and technical skills to real-world activities, using computers and other tools, and being able to see how their learning is related to the world of work make CTE and Practical Living classes more interesting, motivating, and empowering than standard academic classes. This results in a deeper understanding and retention of knowledge while further preparing students for adult life and a chosen career path.

Science

Knowledge Work

A science student must work to acquire knowledge through observation and experimentation to describe and explain natural phenomena. Children are born investigators, as they study, think and build internal models of the world around them. Science is an extension of this natural curiosity to systematic investigation of the material world and the development of a body of knowledge and practices. Through experimental experiences, students work collaboratively and are responsible for communicating their results. These 21st-century skills will help them to be successful as they move from these experiences to college and/or careers. Science education is not just a process of acquiring a body of static knowledge. It also includes developing the ability to use tools, ranging from microscopes and rulers to computers and test tubes, and the ability to build and explain models, make predictions and conduct scientific inquiry. As children begin to understand and influence the world around them, they develop ideas about how the world works and their role in it (NRC, 2010).

Digital Lifestyles

Studying science is essential in the understanding of technology. Technology is the application of scientific knowledge. Our lives are influenced by digital technology to a greater degree now than ever before. Without an understanding of science we can neither understand nor effectively use the complex technological tools that surround us. The development of our increasingly sophisticated civilization was made possible by the discoveries of scientists. In order to sustain this growth, society must be able to continue to advance the frontiers of science. Science provides the opportunity for authentic data collection using a variety of sophisticated measurement tools. Students now have access to electronic data collection devices that can interface with a wide variety of probes capable of measuring many different properties of their environment. After collection, this data may be processed, interpreted and analyzed through the use of various computing technologies.

Learning Research

The 21st-century student must know how to think and read critically, express him/herself clearly and use these skills to solve complex scientific problems. Science is both a body of knowledge and process skills that allow students to practice science. To be proficient in science, students will demonstrate the following skills:

- know, use and interpret scientific explanations of the natural world
- design and analyze investigations, make and evaluate models, and use evidence to build and defend arguments
- recognize that predictions and explanations can be revised through finding new evidence or learning new facts
- understand science is a social enterprise, and participating in a scientific community through work with peers develops skill in representing ideas, using scientific tools, analyzing data and sharing scientific ideas

Teaching science in this way will allow students to have the skills necessary to be prepared for colleges and careers in the 21st century.

Examples of Integrating Technology into Science Instruction

ELEMENTARY **Contributed by: Patti Works, Melinda Kinsel, Josh Radner, Science Labs (K-5) Fayette Co.**
One of our goals in the lab is to provide multiple experiences for students to demonstrate understanding of science concepts. Technology applications are a natural fit for collecting, recording, and interpreting data. Included are a few ways that we've used technology over the years.

- Light meters- students use to interpret strength of direct/slanted light rays- Earth/Sun relationships
- Digital Microscopes- students use to observe and analyze structures of organisms
- Go! Motion (Vernier Software)- students measure and graph motion in real time
- Go! Temperature Probes (Vernier Software) – students use to communicate collected temperature data
- Plant Cam- a digital camera positioned in an outdoor garden to capture time-lapse photography of plant growth. Students observe growth of plants they have planted.
- Smart Board- interactive Web-based activities
- Power Point presentations- students are asked to create a technology application of choice to take to younger students and teach content that they've learned
- Flip Cameras- students use flip cameras to create a video for environmental awareness-conservation efforts at school. They in turn share the video on the morning news program.

SECONDARY **Contributed by: Shane London, Barren County High School**
My goal is to use technology to enhance student achievement. In today's world, technology is a way of life for my students. By using different forms of technology, I can connect with students in ways that were not available before. Here are some ways my students use technology in my classes:

- Use my online classroom site where students access announcements and links to assignments, forms and relevant websites.
- Receive immediate feedback and track data using the Clicker Response System.
- Receive announcements and reminders by using Twitter to stay in touch with my students.
- Allow students to download a podcast of the lesson for review.
- Giving students online access to our curriculum, practice quizzes and videos that are relevant to our studies.
- Utilize Smart Board technology to present information to students
- Use a document camera to project worksheets and graphs on the board.
- Assign open ended tasks and let the students use different forms of technology to present material to the class.

Social Studies

Knowledge Work

The subject of social studies is a holistic exploration of how societies have changed over time. More specifically, the social studies explore how communities, over the course of their history, have created and adapted economic, political and social institutions and models in response to changing human and geographic conditions. Through the social studies, students identify, analyze, debate, understand and pose solutions to complex social, political and economic problems. The social studies is composed of the disciplines of history, geography, economics and government/civics.

The highly effective social studies classroom helps students develop the ability to recognize and understand the concepts of change over time, context, complexity, contingency and causality in an effort to positively direct the course of society. Students do this by locating, vetting, analyzing and interpreting information in order to debate, discuss, understand and make and evaluate decisions about the core issues facing a community.

Learning in the social studies classroom provides students with the knowledge and skills to understand issues and to contextualize and apply information to these issues on both micro- and macro-levels in order to make informed decisions. This includes the ability to:

- understand that, over time, changing political power, economic structures, technological tools and cultural practices effect people and places
- describe and critique past societies or other cultures free from personal or modern bias
- evaluate the impact of multiple factors in shaping events, places and groups
- identify cause and effect conditions
- recognize the role of individual prerogative in determining the course of history
- understand the complexity of inherent social issues
- identify points of view, perspectives, bias and propaganda
- discern between fact and opinion, and positive and negative outcomes
- access and evaluate information for authenticity and authority
- use interpersonal and problem-solving skills to lead and/or collaborate within a team to accomplish an outcome
- frame, analyze and synthesize information in order to solve problems and answer questions
- exercise flexibility and willingness to be helpful in making necessary compromises to accomplish a common goal
- act responsibly with the interests of the larger community in mind
- bridge cultural differences and use differing perspectives to increase innovation and quality of work

Digital Lifestyles

Learning in the social studies requires students be able to locate, analyze and interpret information. Technology provides greater access to historical information and makes it easier and faster to produce and disseminate new information. Students must be able to vet, curate and interpret massive amounts of data quickly and efficiently. An effective social studies curriculum will prepare students to:

- demonstrate cultural competency in the communication of knowledge, points of view, perspectives and ideas and seek support for these through digital and multi-media presentations
- display data graphically
- use communication tools and/or digital repositories appropriately to access, manage, organize and evaluate information
- use digital and multi-media tools to apply and interpret data accurately regarding an issue or problem
- understand the ethical and legal issues surrounding the access and use of information
- use digital tools and networks appropriately to communicate information and to access, manage, integrate, evaluate and create information
- conduct historical investigations using a variety of media

Learning Research

Challenging social studies instruction makes use of regular interpretation and analysis of various types of documents, such as primary and secondary sources, graphs, charts and data banks. These include discipline-based literacy, multi disciplinary awareness, information-gathering, analysis, inquiry, critical thinking, communication, data analysis and the prudent use of 21st-century media and technology.

Powerful social studies lessons allow students to analyze points of view, perspectives, issues and public policies in a variety of learning modes. Social studies instruction promotes the integration of the elements of all the disciplines to conduct historical inquiries, participate in service learning projects, develop and display data, synthesize findings and make critical judgments.

Thomas Jefferson and other founders of the Republic emphasized that the vitality of a democracy depends upon the education and participation of its citizens. The need for an informed citizenry was the very impetus for the creation of a free public education in the United States. If the nation is to adequately develop the readiness of its citizenry to carry forward its democratic traditions, it must support progress toward effective social studies teaching and learning.

See the following example that demonstrates authentic social studies learning.

Kelley West, Christ the King School (non-public school)
Jennifer Fraker, Tates Creek High School (Fayette County)

Project Citizen

This project spans both the 8th grade social studies curriculum and the required 9th grade high school coursework with a creative approach to teaching that involved students in the real world of civic responsibility. The collaborative experiences designed by a non-public school and public school educators helped students to better understand government and democracy, and encouraged the engagement of students in current events, simulations and a service-learning project. Students displayed an unusually good grasp of knowledge and civic dispositions because of the real-world community context of the learning.

The "super" Project Citizen was launched during a Discovery Seminar at the University of Kentucky toward the goal of improving civic education, including drafting a bill for the Kentucky legislature. At UK, the students celebrated Constitution Day. Some of the day's festivities included an address by former Secretary of State Trey Grayson, and the 8th grade students' involvement in a mock debate on the U.S. Senate race and participation in a "relay race for mayor" of Lexington.

Upon return to their respective schools, students went to work drafting what is now called the "Henry Clay-Sandra Day O'Connor Civic Education Act for Kentucky." The eighth grade students from Christ the King participated in a "Skype Congress" with the ninth grade students from Tates Creek High School to "reconcile" various segments of their draft bills. A senator representing the district was able to join in the Skype session with the eighth grade students and to comment on the bills. In addition, a social studies consultant for the Kentucky Department of Education was able to contribute via conference call. This was a wonderful opportunity for the students to discuss civic issues with civic leaders and experts in the field while sharing their perspectives, and utilize technology.

In a culminating activity on March 3, 2011, a dozen of the top 8th and 9th graders involved in "super" Project Citizen went to Frankfort to lobby for two civic education bills during the legislative session and to seek a sponsor for a draft of the Clay-O'Connor Act for the next legislative session. There students met with the senators for their district and were able to receive sponsorship from both senators.

[Education] must include the skills necessary for civic competency: analytical skills needed to make informed and reasoned decisions about public issues; basic knowledge of governmental institutions; and participation in community affairs." *Breaking New Ground: Final report of the Governor's Task Force on Transforming Education in Kentucky* (TEK), 2011

World Languages and Cultures

Knowledge Work

Beyond the obvious use of another language to communicate with people around the globe, learning a language improves cognitive skills; increases opportunities for college admission; and prepares students for the global workplace and social life in diverse communities.

Learning a world language also develops the soft skills that colleges and employers stress are predictors of success as they learn the following skills:

- communicate effectively
- understand more clearly their own language and culture
- think critically about what they see, hear, and read
- problem-solve and negotiate in complicated situations
- collaborate effectively with people who think differently
- become creative and innovative in their self-expression and interpretation
- develop an openness and disposition toward cultural differences
- develop their own and the Commonwealth's potential for success in a global workforce

Digital Lifestyles

Learning a world language develops the skills for communication and cultural competency that are essential for the diverse environment in which we live and work. By engaging in activities in class, in the local and world community, and through technologies, students learn to communicate through the spoken and written word, interpret text and speech, and present to a variety of audiences through speaking and writing—all in an authentic cultural context (see a teacher example that follows) or through the signed word and interpreted American Sign Language (ASL) in an authentic cultural context. Speech-impaired students may learn to communicate a new language through the written word and use technology to deliver the spoken word.

Learning Research

Language learning should begin as early as possible, focus on the functional use of language and occur inside and outside classrooms in authentic cultural contexts. The aim of language learning is to communicate inter-culturally. Kentucky's Standard for World Language Proficiency describes the core language and inter-cultural competencies that students should strive to attain and provides easy-to-

understand “Can Do” statements that show learners what they can do at specific levels of proficiency. Teachers, parents and students can use these statements to set goals and assess learning.

Language learning can take place inside and outside of a school program. In preschool-grade 12 classes, the target language is used at least 90 percent of the time. Instruction provides opportunities for students to set personal goals for learning the language and culture, experience the language in context with native speakers and use the language to communicate with others. In content-based *classes*, subjects such as arts and humanities, PE, agriculture and others are taught and learned in the target language. In language immersion schools, subjects such as math and science are taught and learned in the target language in all grades; so, students acquire both a world language skill and knowledge of another content area.

Lucas Gravitt, German, Scott County High School

Podcasting, Google Voice and the ILP

When I began working with a Zune and later an iPod Touch, I found that there are many great ways to use these devices in the classroom, especially through podcasts. I frequently search the Zune Marketplace or the iTunes Store to find new podcasts to use in class. It's convenient because my computer automatically downloads new podcasts to which I already subscribe.

There are podcasts, for my interest and use in particular, that teach specific German language skills. Some read the news in German and some are similar to talk radio. It is so valuable for students to be able to hear and use natively spoken foreign language so that they can begin to mimic the pronunciation and sounds patterns from natives.

From iTunes, I've successfully downloaded and used podcasts from EF Tours, the company I use to travel abroad with students; I also distribute those EF Tours podcasts to students, so that they can learn, in advance, about places we are going to visit, **and** they can listen to history lectures or stories on their own devices as we travel through Europe. For the parents and chaperones who do not speak German there are simple German words and phrases that are podcasted so that they can learn to ask directions, or find the bathroom, or order at a restaurant.

While utilizing preexisting podcasts has been a great way for me to use the Zune and iPod Touch in class, I also have moved into student-generated materials. Frequently, rather than doing individual verbal/oral exams, I have the students podcast their exam material and share it with me. I then am able to download my students' podcasts on our classroom Zune or my personal iPod and listen to it at a time that's convenient for me. As added benefits, I don't waste an entire day of instruction listening to everyone's exam during class time, students learn how to create and use podcasts purposefully and the process almost completely removes the stress or anxiety factor from the students' performance.

In addition, I have begun to switch my podcasting use for verbal/oral exams to Google Voice (which is tied to my school email) so that students can, with parent's permission, call to leave a voicemail and send an SMS/text message for the assessment. All of these come directly to my Inbox. This way, I can listen to the performance exam several times, pause and rewind, and keep them for further reference.

My next steps are to tie all of these podcasts and Google Voice voicemails with the student videos and presentations to the Career Cruising ILP website, and ultimately I can use these pieces as part of the new writing program review. I also hope to begin to incorporate more iPod apps in the classroom to help extend the connection to student-utilized and student-centered technology.

Cross-Curricular Integration



Science, Technology, Engineering and Mathematics (STEM)

STEM education is a “meta-discipline” consisting of science, technology, engineering and mathematics at the heart of today’s high-tech, high-skill global economy. For America to remain economically competitive, our next generation of leaders - the students of today - must develop the critical-reasoning and problem-solving skills that will help make them the most productive in the world. Historically, the four STEM disciplines have been taught independent of each other. By adopting the STEM philosophy, however, these four disciplines work in tandem to help students better understand the whole. Science, engineering and mathematics content are made complete by the integration of technology that provides a creative and innovative way to problem-solve and apply learning.

Kentucky is using Project Lead the Way (PLTW) as a way to advance this “meta-discipline” approach. PLTW is a nationally-recognized middle and high school curriculum that focuses on project- and problem-based contextual learning aimed at cultivating students’ interest in pursuing careers in engineering and engineering technology. The curriculum is founded in the fundamental skills taught in traditional career and technical education (CTE) while integrating national academic and technical standards. U.S. Secretary of Education Arne Duncan hailed this effort as one of the “great models of the new CTE succeeding all across the country.” The Harvard Graduate School of Education agreed, stating that this is an effective "model for 21st century career and technical education.”

Across Kentucky alone, there are considerable data supporting the success of PLTW and STEM education, primarily:

- Eighty percent of current high school seniors in PLTW programs plan to go to college (state average is 63 percent).
- Forty percent of former PLTW participants are studying engineering in college.
- Across all demographic groups, PLTW students are more likely to go into STEM majors in college than other students.

Literacy Across the Curriculum

Recognizing that each subject area has its own language, or languages, and that language is central to learning, the importance of literacy cannot be overstated. As students discover how to use the language of the discipline, they find they are able to think in different ways, access new areas of knowledge and see the world from new perspectives.

For each area, students may need specific help as they learn:

- the specific vocabulary associated with that area
- how to read and understand texts of the specific discipline
- how to communicate knowledge and ideas in ways appropriate to the discipline
- how to listen and read critically, assessing the value of what is heard and read
- how to use library, media and technology to assist in the learning of the discipline

(See Beyond Proficiency @your library, KY Library Media Guidelines)

> *"The future will demand people who can express themselves effectively with images, animation, sound and video, solve real world problems that require processing and analysis of thousands of numbers, and evaluate information for accuracy, reliability, and validity, and organize information into valuable knowledge…"*
>
> *2010, Transforming Education in Kentucky (TEK) Task Force Recommendation 6A*

In addition, non-native speakers and students coming into the district/school for the first time may need explicit and extensive teaching of English vocabulary, word forms, sentence and text structures, and language uses. This would include deaf or hard of hearing students who use American Sign Language (ASL).

Kentucky Literacy Link is a KDE publication designed to address topics that impact literacy instruction in all Kentucky classrooms.

Think and Apply

Consider the four converging forces (knowledge work, digital lifestyles, thinking tools and learning research). Chart and share examples of how each force will influence curriculum planning and implementation within your own classroom or content area.

Four Powerful Forces Converging and Leading toward new ways of learning for life in the 21st century			
Knowledge Work	**Thinking Tools**	**Digital Lifestyles**	**Learning research**

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National Business Education Association—
http://www.nbea.org/

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National Council of Teachers of Mathematics—http://www.ncte.org/

National Council for the Social Studies—http://www.socialstudies.org/

National Marketing Education Association—http://www.nationalmea.org/

National School Climate Council—http://nscc.csee.net/aboutnscc/council.aspx

National Science Teachers Association—http://www.nsta.org/

National Research Center for Career & Technical Education—http://www.nrccte.org/

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Inside this section:

- 21st-Century Assessment Defined
- Processes, Knowledge and Skills for Formative Assessment
- Elements of Assessment

21st-Century Assessment Defined

Assessment is the systematic collection of data about student learning in order to adjust and improve future instruction. **Assessment and instruction are inseparable because building new knowledge upon the prior experiences of each child is essential to achieve desired outcomes, select appropriate instructional methods, improve future assessment and curriculum designs, and systematically but flexibly meet rigorous common standards for all learners.** When treated as the core of successful instruction, **formative assessment leads to increased student learning and achievement**. Each activity used in a classroom lesson or unit becomes a learning task that provides data for teachers and students to use together. When teachers sequence these formative learning tasks carefully and use the resulting data to adjust instruction along the way, they are able to systematically provide students with multiple opportunities to learn concepts, practice skills and strategies, and apply knowledge in meaningful ways. **Careful sequencing and monitoring of data during instruction** should explicitly prepare students for success on summative assessments like classroom exams, extended written response essays, performance assessments and standardized tests. Their learning increases and they meet high standards as a matter of design, systematic collaboration and data-driven teaching. As such, formative assessment practices are the core of instruction.

In order to support this kind of systematic design for student success, it is essential for schools and districts to have a clearly written, explicit and comprehensive assessment plan. The plan needs to be understood and supported by all teachers, curriculum and instructional supervisors, administrators, students and parents/guardians. This is important in order to align curriculum and help all stakeholders in the educational process understand the purposes of classroom assessment and how it differs from state-level accountability (e.g., high stakes standardized testing). Assessment plans are strategically implemented for four purposes related to curriculum planning:

1. Meet individual learning needs,
2. Monitor progress,
3. Evaluate and improve programs and screening of students' needs.
4. Identify children with special learning needs—either needs for intervention/remediation or acceleration/enrichment.

"The teacher understands and uses multiple methods of assessment to engage learners in their own growth, to document learner progress, and to guide the teacher's ongoing planning and instruction."

(Interstate Teacher Assessment and Support Consortium (InTASC) Standard #6: Assessment)

The assessment plan, written in collaboration among the stakeholders listed above, focuses on improving student learning first, and then on alignment with state accountability systems. Such a plan typically includes:

- a system to ensure assessment is ongoing, strategic and purposefully used by teachers and students to reflect on learning and make decisions about future work
- a system for sharing data about adjacent grade-level assessments to inform adjustments to curriculum when appropriate
- strategies for teachers to exchange information on a regular basis within and between grade levels in ways that promote clear transitions from year to year and optimize student success in every classroom
- ways for educators and parents/guardians to share information on a regular basis to support decisions made to extend student learning.

Processes, Knowledge & Skills for Formative Assessment Use

(Adapted from Bailey & Heritage, 2008)

Processes, Knowledge and Skills for Formative Assessment Use	
Instructional Planning of Lessons and Units	Requires a. content knowledge b. pedagogical content knowledge (knowledge of content-specific instructional methods, learning strategies and assessment practices) c. standards knowledge d. student data use and analysis Identify gaps and re-teach Adapt curriculum, pace, instruction, resources and environment to meet the needs of all learners
Assessment Design and Strategies	• Sequence learning tasks based on learning progressions. • Implement student practice. • Assess students' understanding of learning targets.
Data Analysis and Feedback	• Analyze and interpret formative assessment data. • Communicate with students and others on growth, progress and learning needs. • Determine next steps for curriculum and instruction--make decisions at the student and program levels.

Elements of Assessment

Adapted from Stiggins, Arter, Chappuis, & Chappuis, Classroom Assessment for Student Learning (CASL), 2006

	Assessment *for* Learning (Formative Assessment)	Assessment *of* Learning (Summative Assessment)
Reasons for Assessing	Promote increases in achievement to help students meet more standards; support ongoing student growth; improvement	**Document individual or group achievement or mastery of standards; measure achievement status at a point in time for purposes of reporting; accountability**
Audience	Students about themselves	**Others about students**
Focus of Assessment	Specific achievement targets selected by teachers that enable students to build toward standards	**Achievement standards for which schools, teachers, and students are held accountable**
Place in Time	A process during learning	**An event after learning**
Primary Users	Students, teachers, parents	**Policy makers, program planners, supervisors, teachers, students, parents**
Typical Uses	Provide students with insight to improve achievement; help teachers diagnose and respond to student needs; help parents see progress over time; help parents support learning	**Certify student competence; sort students according to achievement; promotion and graduation decisions; grading**
Teacher's Role	Transform standards into classroom targets; inform students of targets; build assessments; adjust instruction based on analysis of results; offer descriptive feedback to students; involve students in assessment	**Administer the test carefully to ensure accuracy and comparability of results; use analysis of results to help students meet standards; interpret results for parents; build assessments for report card grading**
Student's Role	Self-assess and keep track of progress; contribute to setting goals; act on classroom assessment results to be able to do better next time	**Study to meet standards; take the test; strive for the highest possible score; avoid failure**
Examples	Using rubrics with students; student self-assessment; descriptive feedback to students	**Achievement tests; final exams; placement tests; short cycle assessments**

"Formative assessment is a planned process in which assessment-elicited evidence of students' status is used by teachers to adjust their ongoing instructional procedures or by students to adjust their current learning tactics." (James Popham, Classroom assessment: What teachers need to know, 2008)

Assessment Literacy –The key to differentiating the types of assessment is the use of the data. The following chart defines types of assessments and their uses. Examining evidence from multiple data sources and understanding the intended use of the data helps educators to gain deeper insight into students' learning needs.

Formative Assessment-- a process used by teachers and students **during instruction** that provides feedback to adjust **ongoing teaching and learning** to improve students' achievement of the intended instructional outcomes. Examples: classroom observations, teacher-designed classroom assessments, analysis of student work
Interim Assessments--assessments administered multiple times during a school year **to evaluate students' knowledge and skills** relative to a specific set of academic goals at the student, classroom, school, or district level. Interim assessment results indicate if a student has met a standard or if the student is on his way to meeting a standard. The results of any interim assessment are received some time after the test is administered. The data is used to make program decisions regarding when the students can revisit the standard since the class may have moved beyond that standard or have not yet addressed the standard. The results of any interim assessment must be reported in a manner **allowing aggregation across students, occasions or concepts**. Example: assessments generated by those other than the classroom teacher and designed to assess how well a group of students is meeting a standard.
Summative Assessment--an assessment given at the end of the school year, semester or other period of time to evaluate students' performance Examples: unit assessments, state assessments, ACT

Think and Apply

List some of the formative assessment strategies used in your district/school/classroom. How do they inform the teaching **and** learning?

View some of the Web resources cited on the next page, and share additional formative assessment strategies for future use to advance learning opportunities for students.

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Connecting Formative Assessment RESEARCH to PRACTICE
http://www.learningpt.org/pdfs/FormativeAssessment.pdf

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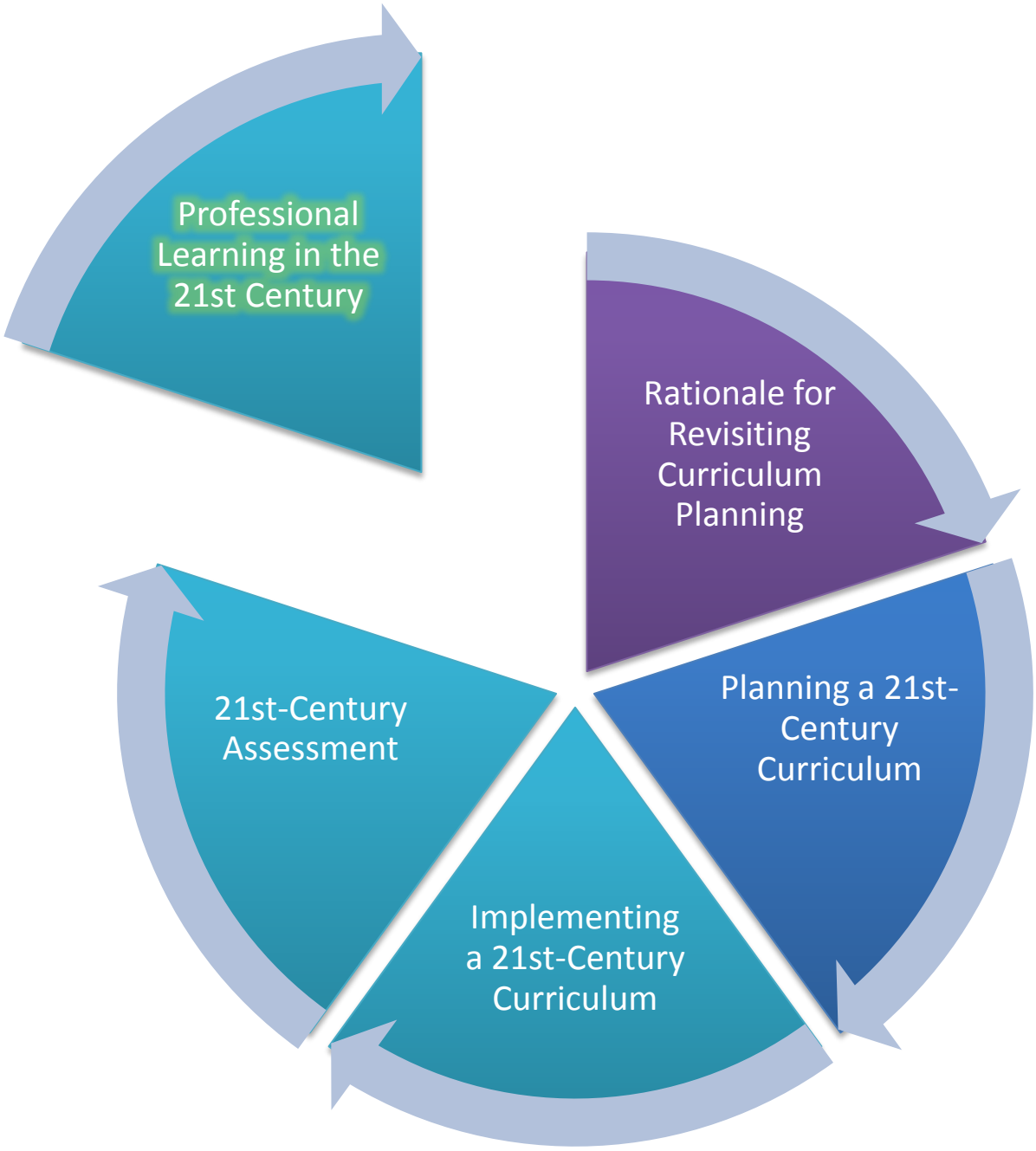

Inside this section:

- Professional Development in the 21st century
- Professional Learning Communities and Professional Learning Networks

Professional Development in the 21st century

Learning to teach is a career-long process. A commitment to personal learning and professional growth is required. Through guided decision-making, evidence-driven self-reflection and honoring different ways of learning, teachers and leaders can shape their growth and address their learning needs. District and school leaders who understand the importance of a positive climate, the establishment of structures (daily schedule, yearly calendars, remote learning) that support personal and professional learning, and the availability and allocation of resources (people, time, materials and funds) ensure successful implementation and sustained professional development.

Professional development is defined in 704 KAR 3:035 Section (2) as "those experiences which systematically over a sustained period of time, enable educators to acquire and apply knowledge, understanding, skills, and abilities to achieve personal, professional, and organizational goals to facilitate the learning of students."

The National Staff Development Council created a definition of professional development in their work as "a comprehensive, sustained, and intensive approach for improving teachers' and principals' effectiveness in raising student achievement."

Professional Development takes place within a professional learning community, defined as a collegial group of administrators and school staff who are united in their commitment to student learning. They share a vision, work and learn collaboratively, visit and review other classrooms, and participate in decision making (Hord, 1997b). The benefits to the staff and students include a reduced isolation of teachers, better-informed and committed teachers, and academic gains for students.

Professional development for school and district improvement is a continuous process of learning through consciously constructed, relevant, job-embedded experiences so that professional development experiences are integrated in the day-to-day work of teachers, administrators, and others to support improved practices, effectiveness and the application of skills, processes and content. Synchronous models of professional development are developed to provide learners the opportunity to be in a live scheduled environment working directly with a trainer, coach or mentor. These opportunities include face-to-face learning sessions, learning labs, conferences, professional learning communities, just-in-time learning and more. Asynchronous models of professional development allow educators flexibility to learn as needed any time, anywhere. This model could include documents, frameworks, videos, Kentucky Education Television (KET) strands, video conferencing, blogs, mobile Web applications and others which could then be shared with other training partners to support all professionals working with students inside and outside of the school system (i.e. child care, Save the Children, YMCA, 4-H, Head Start, independent therapists, foster parent supports, child mental health agencies, volunteer groups).

Professional development for school and district improvement is a continuous process of learning through consciously constructed relevant job-embedded experiences so that professional development experiences and professional learning are integrated in the day-to-day work of teachers, administrators and others to support improved practices, effectiveness and the application of skills, processes and content.

Standard 2 Kentucky Professional Development Standards

The Partnership for 21st Century Skills states "the success of education in the 21st century calls upon educators to confront broad pressures now shaping our children's future." The partnership lists three factors for this call to action:

- **Global Competition in Education--**The United States can no longer claim that students outperform the rest of the world.
- **International Innovation**--Innovators outside the United States rival the breakthroughs that fuel economic competitiveness. The United States no longer leads the way to creative and innovative solutions.
- **Greater Demands in the Workplace--**Workplaces are being transformed into highly skilled environments. No longer is a high school diploma for a student enough to secure and hold a job that will provide a quality standard of living over a lifetime of work. The goal should be to equip every student with the skills, content knowledge, and experiences to succeed in work and life.

The world in which our students reside has changed with globalization, an innovation economy and the communication tools of today. Students use a variety of tools for creativity, interaction and communication. The challenge of education is to take the many tools available to guide students to their use in critical thinking, innovation, global awareness and problem-solving.

If students are to achieve these goals, educators will need to expand their knowledge, skill sets and willingness to learn and infuse these practices into their classrooms. The success of education in the United State depends on teachers who are masters in their knowledge of core subjects as well as the strategies that engage and challenge students in their learning. Teachers not only have to teach traditional subjects in new ways that acknowledge our digital future, but also introduce new topics that may be unfamiliar and have not been taught. While standards and assessment practices continue to evolve, so must instructional practice in the classroom.

Educators who embrace technology tools and resources and districts that have built the infrastructure and identified the purposeful use of these tools and resources in reaching the instructional learning goals will both engage and ensure positive learning outcomes for students. The use of technology facilitates teaching, learning and community partnerships and provides access to unlimited resources. Technology enables access to community and global experts, access to mentors and coaches for personal growth and student connections, and creates that student-centered learning environment that is essential to 21st-century learning.

Professional Learning Plan

In response to KRS 158.6451 (Senate Bill 163, 2010), the Kentucky Department of Education has designed professional learning resources to help schools work through the process of building and evaluating a high-impact professional learning plan. The *High-Impact Professional Learning Plan* includes internal feedback tools for schools to use throughout the professional learning (PL) process to monitor the effectiveness of the PL experience and make necessary adjustments.

The order of the documents with descriptors

- Cover Page – describes purposes for each Professional Learning document
- *Building a High-Impact Professional Learning Plan* – a document designed to guide schools through the process of developing a professional learning plan that will enhance instruction
- *A Guide for Evaluating the Impact of Professional Learning* – a process guide (to be used in conjunction with the three feedback tools)

  - ✓ **Tool # 1 – *Professional Learning Reflections* – a reflection resource to capture initial reactions**

  - ✓ **Tool # 2 – *Follow-up Reflections* – an early impact monitoring tool**

  - ✓ **Tool # 3 – *Professional Learning Outcome Reflections* – a long-term impact tool**

Professional Learning Communities/Professional Learning Networks

Professional Learning Communities and Networks rest on similar assumptions about how staff in schools learn and change their practice.

1. Teaching is complex, so learning throughout the career is necessary.
2. A great deal of untapped knowledge exists in schools.
3. Many challenges staff face are local challenges and need to be addressed 'on the ground.'
4. Staff improve their practice by analyzing, evaluating and making changes with peers.

> *An ongoing process* in which educators work collaboratively in recurring cycles of collective inquiry and action research to achieve better results for the students they serve. Dufour, Dufour, Eaker, and Many 2010

Professional Learning Communities (PLC) –The term *professional learning community* describes a collegial group of administrators and school staff who are united in their commitment to student learning. The benefits to the staff and students include a reduced isolation of teachers, better-informed and committed teachers, and academic gains for students. PLCs create a school climate that fosters opportunities for teachers to problem-solve around teaching and learning issues. PLCs that are self-directed can be highly productive because teachers often lead their own learning. The ultimate outcome of professional learning communities has to be experienced by students through the impact on student achievement. Being a part of a professional learning community can have a positive impact on teachers' work lives, their learning and improvement in practice, as well as improvement of the school.

Professional Learning Networks (PLN) - Networks, collaboration and partnerships provide teachers with professional learning communities that support changed teaching practices in their own schools and classrooms. Today, with the advent of social media, teachers are networking globally in ways never thought possible. Teachers from around the globe can connect to discuss and evaluate various solutions to educational challenges, share resources and ideas, discuss topics of interest, plan events and much more.

"Who dares to teach must never cease to learn."-John Cotton Dana

Think and Apply

If you participate in a professional learning community or professional learning network, share how this participation has changed your professional practice.

Think about some best practices and promising approaches in your school or district. How could these best practices and promising approaches be shared with a larger audience?

Reflect on the information offered in this resource. What revisions are you considering to your plan for professional learning?

References and Resources

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Photographs

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~The following groups were invited to send representatives to participate in focus groups and to provide feedback on an early draft of this resource:

Kentucky Historical Society

Kentucky Council of Teachers of English

Kentucky School Media Association

Kentucky Center for Instructional Discipline

Kentucky Community Education Association

National Center for Family Literacy

Kentucky Parent Information and Resource Center

Commonwealth Institute for Parent Leadership

Kentucky Association for Career and Tech Education

Kentucky Reading Association

Kentucky Parent-Teacher Association

Kentucky Arts Council

Kentucky Association of School Councils

Kentucky Council of Teachers of Math

Instructional Supervisors Leadership Network

Kentucky Association for Environmental Education

Kentucky Out-of-School Alliance

Kentucky Association of Health, PE, Recreation and Dance

Kentucky School Board Association

Institutions of Higher Ed-Early Childhood Faculty

Kentucky Association for Early Childhood Education

Kentucky Center for the Performing Arts

Kentucky Council for Social Studies

Kentucky Council for Exceptional Children

Kentucky Society for Technology in Education

Kentucky Educational Television

Kentucky Educational Cooperatives

Kentucky Special Education Cooperatives

Kentucky Music Educators Association

Kentucky Association for Gifted Education

Prichard Committee

Kentucky Heritage Council

Kentucky Theater Association

Kentucky Association of School Administrators

Kentucky Science Teachers Association

Kentucky World Language Association

Kentucky Center for School Safety

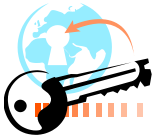
Kentucky Council on Economic Education

Kentucky Education Association

Kentucky Association of Educational Supervisors

Kentucky Educational Speech and Drama

New Cities Institute/ Kentucky League of Cities for the Partnership for Successful School



Principles or beliefs about what the Commonwealth of Kentucky wants for its learners

Although similar, the Learning Goals and Capacities enacted in 1990 have different functions.

The **Learning Goals** are specific to schools. The **Capacities** relate to the importance of a sense of "shared responsibility" from schools and their partners (government, communities, and parents/guardians) in creating a system that prepares students for life, meaningful work and citizenship. The **specific ways** in which these find expression in an individual school will be **guided by the conversations between the school and its community**.

158.6451 Legislative declaration on goals for Commonwealth's schools -- Model curriculum framework.
(1) The General Assembly finds, declares, and establishes that:
(a) Schools shall expect a high level of achievement of all students.
(b) Schools shall develop their students' ability to:
1. Use basic communication and mathematics skills for purposes and situations they will encounter throughout their lives;
2. Apply core concepts and principles from mathematics, the sciences, the arts, the humanities, social studies, and practical living studies to situations they will encounter throughout their lives;
3. Become self-sufficient individuals of good character exhibiting the qualities of altruism, citizenship, courtesy, hard work, honesty, human worth, justice, knowledge, patriotism, respect, responsibility, and self-discipline;
4. Become responsible members of a family, work group, or community, including demonstrating effectiveness in community service;
5. Think and solve problems in school situations and in a variety of situations they will encounter in life;
6. Connect and integrate experiences and new knowledge from all subject matter fields with what they have previously learned and build on past learning experiences to acquire new information through various media sources; and
7. Express their creative talents and interests in visual arts, music, dance, and dramatic arts.

158.645 Capacities required of students in public education system. (1990)
The General Assembly recognizes that public education involves shared responsibilities. State government, local communities, parents, students, and school employees must work together to create an efficient public school system. Parents and students must assist schools with efforts to assure student attendance, preparation for school, and involvement in learning. The cooperation of all involved is necessary to assure that desired outcomes are achieved. It is the intent of the General Assembly to create a system of public education which shall allow and assist all students to acquire the following capacities:
(1) Communication skills necessary to function in a complex and changing civilization;
(2) Knowledge to make economic, social, and political choices;
(3) Core values and qualities of good character to make moral and ethical decisions throughout his or her life;
(4) Understanding of governmental processes as they affect the community, the state, and the nation;
(5) Sufficient self-knowledge and knowledge of his mental and physical wellness;
(6) Sufficient grounding in the arts to enable each student to appreciate his or her cultural and historical heritage;
(7) Sufficient preparation to choose and pursue his life's work intelligently; and
(8) Skills to enable him to compete favorably with students in other states.