

# 21<sup>st</sup> Century Learning

Preparing Students for Their Future



## Technology Advances

### Mind Streaming

Describe how the following have changed during your lifetime:

- Computers
- Internet
- Modem Speed



## 3 Essential Questions

- Why are 21st Century Skills so important?
- How does 21st Century Learning impact students?
- What can you do to incorporate 21st Century learning in your classroom and school?

## 6 Exponential Trends

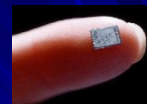
1. Moore's Law
2. The Law of the Photon
3. The Internet Revolution
4. The Age of Info Whelm
5. Biotechnology
6. Nanotechnology



## Why are 21<sup>st</sup> Century Skills so Important?



## Moore's Law



- The processing power and speed of any electronic calculating device doubles every 18 months while the price decreases by 50 %

Twice the power for half the price every 18 months

Year	1979	1984	2003	2015
RAM	16k	128k	256mb	104,032 mb
Hard drive	128k	400k	30gb	12,191 gb
Speed	2 <sub>mbps</sub>	10 <sub>mbps</sub>	1600 mbps	650,199 mbps
Cost	\$5000	\$3900	\$900	\$9

## The Law of the Photon

- Bandwidth speed and capacity per dollar has been tripling every 12 months



## Biotechnology and Nanotechnology

- Biotechnology is using biological processes to develop products or create technological solutions to pharmacology, medicine, agriculture, and mining
- Nanotechnology is not building things down by making them smaller, but building things up by manipulating one atom at a time



## The Internet Revolution



Each day there are:

- 3 million new web pages
- 10 billion instant messages
- 19 billion email messages and 12 billion spam messages
- The web is doubling in size every 120 days
- 80% of the sites that will exist a year from now don't exist today



## How does 21st Century Learning impact students?



## Age of Info Whelm



- More data produced in the last 50 years than in the previous 5000 years
- More than 3000 books are published daily
- Age of Disposable Information
- New technical information doubles every 2 weeks



## 21<sup>st</sup> Century Learning

	20 <sup>th</sup> Century	21 <sup>st</sup> Century
# of Jobs	1 - 2 Jobs	10 - 15 Jobs
Job Skill	Mastery of One Field	Flexibility And Adaptability
Teaching Model	Subject Matter Mastery	Integration of 21 <sup>st</sup> Century Skills into Subject Matter Mastery
Assessment Model	Subject Matter Mastery	Integration of 21 <sup>st</sup> Century Skills into Subject Matter Mastery

## Characteristics of Net Gen

### Think Pair Share

- List the unique characteristics of Net Gen Students
- Describe what you do to meet their needs



## Neuroplasticity – they are wired differently

- The brain reorganizes itself throughout life: neuroplasticity
- Stimulation changes brain structures; the brain changes and organizes itself based on the inputs it receives
- Different developmental experiences impact how people think



—Prensky, 2001

## The Net Generation

- Born in or after 1982
- Ctrl + Alt + Del is as basic as ABC
- Busy with extracurricular activities
- Fascination for new technologies
- Computers have always fit in their backpacks
- Photographs have always been processed in an hour or less
- Bert and Ernie are old enough to be their parents



—Howe & Strauss, 2003

## Teen's Web Use

How many of you...

- check your e-mail more than once a day?
- ... more than once an hour?
- IM - or know what IMing is?
- have their own Blog?
- have used a Wiki?



—Lenhart, Simon & Graziano, 2001; NetDay, 2003

## Products of Their Environments

- | Baby Boomers    | Generation X  | Net Gen               |
|-----------------|---------------|-----------------------|
| ■ TV generation | ■ Video games | ■ The Web             |
| ■ Typewriters   | ■ Computers   | ■ Mobile devices      |
| ■ Memos         | ■ Email       | ■ IM - Text Messaging |
|                 |               | ■ Online communities  |



## Teen's Web Use

- 100% Use the Internet to seek information on colleges, careers and jobs
- 74% of teens use IM as a major communication vehicle vs. 44% of online adults
- 54% of students (grades 7-12) know more IM screen names than home phone numbers
- The Internet is a primary communication tool
  - 81% email friends and relatives
  - 70% use instant messaging to keep in touch
  - 56% prefer the Internet to the telephone



—Lenhart, Simon & Graziano, 2001; NetDay, 2003

## Today's Learners

- Digitally literate
- Mobile
- Always on
- Experiential
- Social



## Partnership for 21st Century Skills [www.21stcenturyskills.org](http://www.21stcenturyskills.org)

- |   |                                  |
|---|----------------------------------|
| ■ Adobe Systems Incorporated                | ■ Intel                          |
| ■ Agilent Technologies Foundation           | ■ JA Worldwide                   |
| ■ American Association of School Librarians | ■ LeapFrog SchoolHouse           |
| ■ American Federation of Teachers           | ■ McGraw-Hill                    |
| ■ Apple                                     | ■ Microsoft Corporation          |
| ■ Bell South Foundation                     | ■ National Education Association |
| ■ Cable in the Classroom                    | ■ Oracle Corporation             |
| ■ Cisco Systems, Inc.                       | ■ Pearson Education              |
| ■ Corporation for Public Broadcasting       | ■ SAP                            |
| ■ Dell, Inc.                                | ■ SAS                            |
| ■ ETS                                       | ■ Texas Instruments              |
| ■ Ford Motor Company                        | ■ Thomas Gale                    |
|   | ■ Time Warner                    |
|   | ■ Verizon                        |

## What can you do to incorporate 21st Century learning in your classroom and school?



## 20<sup>th</sup> Century Model



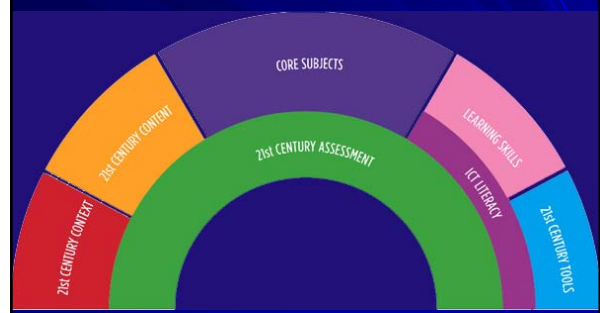
Skilled 21st century citizens should be proficient in **ICT (Information and Communications Technology)**

The interest, attitude and ability of individuals to **appropriately use digital technology and communication tools** to access, manage, integrate and evaluate information, **construct new knowledge** and **communicate with others** in order to **participate effectively in society**.



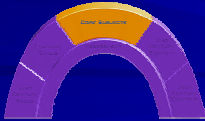
Partnership for 21<sup>st</sup> Century Skills, 2003

## 21<sup>st</sup> Century Model



## Teaching Core Subjects

- English
- Reading or Language Arts
- Mathematics
- Science
- Foreign Language
- Civics
- Government
- Economics
- Arts
- History
- Geography



*No Child Left Behind*

## ICT Literacy Model

Tech Literacy

Competency  
In  
Technology


ICT Literacy

Competency in  
Learning Skills  
Through the  
Use of  
Technology

## Using 21<sup>st</sup> Century Learning Skills

- Information and communication skills
- Thinking and problem solving skills
- Interpersonal and self-directional skills

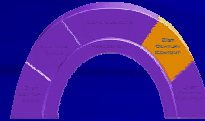
*"The challenge now is to incorporate learning skills into classrooms deliberately, strategically, and broadly."*



*Partnership for 21<sup>st</sup> Century Skills, 2003*

## Within a 21<sup>st</sup> Century Context

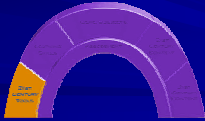
- Learn academic content through real-world examples
- Learning must be relevant, engaging, and meaningful to their lives
- Learning must expand beyond classroom walls



*Partnership for 21<sup>st</sup> Century Skills, 2003*

## With 21<sup>st</sup> Century Tools

In a digital world, students need to learn to use the tools to master the learning skills that are essential to everyday life and workplace productivity. This proficiency is known as ICT Literacy.



*Partnership for 21<sup>st</sup> Century Skills, 2005*

## Teaching 21<sup>st</sup> Century Content

Education and Business leaders have identified three significant, emerging content areas that are critical to success in communities and workplaces:

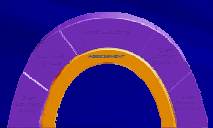
- Global awareness
- Financial, economic, and business literacy
- Civic literacy



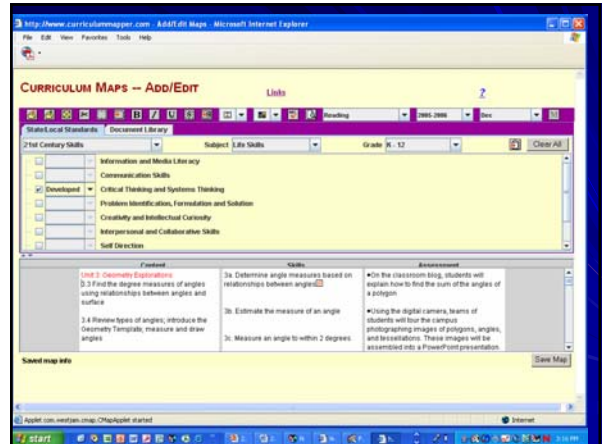
*Partnership for 21<sup>st</sup> Century Skills, 2003*

## Using 21<sup>st</sup> Assessment

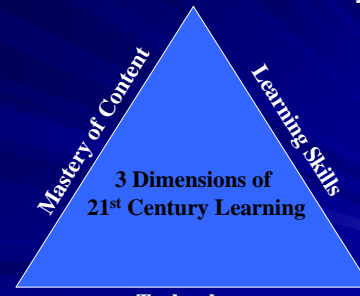
- Measure what we value
- Create measurements that accurately measure what we value



Partnership for 21<sup>st</sup> Century Skills, 2005



## The Amphitheater School District Vision and Mission and 21<sup>st</sup> Century Skills



**3 Dimensions of  
21<sup>st</sup> Century Learning**

November 2005	A. TECHNOLOGY Productivity Tools B. TECHNOLOGY Research Tools	A. Create HTML chart on study of Archaeology websites B. Identify and collect facts from Archaeology websites	A. Checklist completed product B. Checklist completed list of facts
December 2005	A. TECHNOLOGY Productivity Tools B. Writing Process	A. Write, edit and publish a paragraph using Word B. Draft, revise, edit and publish a paragraph about the study of archaeology	A. Rubric- TECHNOLOGY skills B. Six Traits Rubric
November 2005	A. TECHNOLOGY Productivity Tools B. TECHNOLOGY Research Tools	A. Create HTML chart on study of Archaeology websites AZ_Grade_Level_Articulations SCIENCE: Grade 3 + 2.1 PO 2 Describe science-related career opportunities.  21st Century Skills TECHNOLOGY K-12 + Concept Mapping software  B. Identify and collect facts from Archaeology websites  AZ Academic Standards TECHNOLOGY Foundations (Grades 1-3) + ST-1 PO 2 Locate information in a resource selected by the teacher (e.g., Web page, CD-ROM)  21st Century Skills TECHNOLOGY K-12 + Electronic Reference Materials + Website	A. Checklist completed product B. Checklist completed list of facts

## Information and Communication Technology (ICT) Literacy Maps

LEARNING SKILLS FOR THINKING AND PROBLEM-SOLVING  
Creativity and Intellectual Curiosity

Developing, implementing and communicating new ideas to others, staying open and responsive to new and diverse perspectives.

<p><b>21<sup>st</sup> Century Skills for Thinking and Problem-Solving Skills</b></p> <p><b>SAMPLE Student Outcomes for Thinking and Problem-Solving Skills</b></p> <ul style="list-style-type: none"> <li>Use digital video or presentation software to create animations, communications and lectures, or to present a visual oral draft.</li> <li>Combine multimedia, multi-gene weblogs or display to a community historical notes that provide information about a community group.</li> </ul>	<p><b>4th Grade</b></p> <p>Digital observation tools, multimedia production tools</p> <ul style="list-style-type: none"> <li>Use digital video or presentation software to create animations, communications and lectures, or to present a visual oral draft.</li> </ul>	<p><b>5th Grade</b></p> <p>Audio &amp; video recording &amp; production equipment, multimedia production tools</p> <ul style="list-style-type: none"> <li>Create and record a parody of a familiar song using the original lyrics scheme and rhythm, and creating a humorous or ironic effect.</li> <li>Compile a digital classroom anthology (e.g., on CD, DVD) or web published of student work in a variety of genres on the theme "Where We From."</li> </ul>	<p><b>13th Grade</b></p> <p>Audio &amp; video recording &amp; production equipment, multimedia production tools, print publications tools</p> <ul style="list-style-type: none"> <li>Create multimedia presentations to communicate multiple levels of understanding on a specified topic.</li> <li>Use productivity tools to publish a class anthology of each member of a class read during a unit on recreational authors.</li> </ul>
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<p>2.11 Review and assess students' progress on the material covered in Unit 2.</p> <p>Unit 3: Geometry Ex... 2.11 Geometry Explanations</p> <p>3.1 Introduce the American team about the U.S. and to learn about the U.S. conduct a classroom census and conduct a classroom census; and to use to use the Probability Meter</p> <p>3.2 Read and infer... 3.2 Read and infer... if population estimates</p> <p>3.3 Find the degree... 3.3 Find the degree... angles using relationships between angles and surface</p> <p>3.4 Review types of... 3.4 Review types of... measure and draw</p> <p>3.5 Use a compass... 3.5 Use a compass... measure and copy a line segment, bisect and angle</p> <p>3.6 Define equilateral... 3.6 Define equilateral... triangles and congruence</p>	<p>2x Know place value to billions (2.10) D10</p> <p>2f Find the sum and difference of multidigit whole numbers and decimal</p> <p>2g Identify the maximum, minimum, median, mode, and mean for a data set (2.3) S</p> <p>2h Define equilateral triangles, scalene and isosceles triangles; copy angles</p> <p>2i Classify and sort geometric shapes</p> <p>2j Introduce tessellations; discover which regular polygons tessellate and which do not</p>	<p>Mini-conferences</p> <p>+Game-playing: Decision Dash, Polygon Capture, First to 100,</p> <p>+MATH Boxes</p> <p>+Study Links homework assignments</p> <p>+Periodic assessment on multiplication facts</p> <p>+Unit 3 Assessment</p> <p>+On the classroom blog, students will explain how to find the sum of the angles of a polygon</p> <p>21st Century Skills Life Skills: K-12 + Communication Skills introduced</p> <p>+Using the digital camera, teams of students will tour the campus photographing images of polygons, angles, and tessellations. These images will be assembled into a PowerPoint presentation</p> <p>21st Century Skills Life Skills: K-12 + Information and Media Library introduced + Problem Identification, Formulation and Solution introduced + Creativity and Intellectual Curiosity introduced + Interpersonal and Collaborative Skills introduced</p>	<p>Calculator</p> <p>Blogging</p> <p>21st Century Skills Technology: K-12 + Blogging introduced</p> <p>Digital camera</p> <p>21st Century Skills Technology: K-12 + Digital Camera introduced</p> <p>PowerPoint</p> <p>21st Century Skills Technology: K-12 + PowerPoint introduced</p> <p>Projector</p> <p>21st Century Skills Technology: K-12 + Projector introduced</p> <p>www.bes.edu</p> <p>21st Century Skills Technology: K-12 + Website introduced</p>
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Month/Year	Content	Skills	Assessment
August 2005	A. Fundamental Operations and Concepts	A. Type name with initial capital [1] A. Operate keyboard with correct hand position [1]	A. Checklist/teacher observation
September 2005	A. Social, Ethical and Human Issues B. TECHNOLOGY Productivity Tools	A. Demonstrate correct posture and seating position [1] A. Discuss responsible computer use A. Describe appropriate use of computer [1] B. Write using word processing program [1] B. Locate proper punctuation, shift and tab keys [1]	A. Check-dos and don'ts of computer behavior B. Rubric 6 traits
October 2005	A. TECHNOLOGY Productivity Tools A. Geometry and Measurement	A. Label, identify and cut geometric shapes using a compass [1]	A. Rubric
November 2005	A. Social, Ethical and Human Issues B. TECHNOLOGY Productivity Tools	A. Discuss responsible computer use A. Describe appropriate use of computers A7. Academic Standards TECHNOLOGY Foundations (Grades 1-3) • 21.1.2 Practice responsible use of software B. Write using word processing program 21st Century Skills TECHNOLOGY K-12 • Word Processing B. Locate proper punctuation, shift and tab keys A7. Academic Standards TECHNOLOGY Foundations (Grades 1-3) • 21.1.1 PD 1 Use word processing to create a document and where developmentally appropriate, use editing tools	A. Check-dos and don'ts of computer behavior B. Rubric 6 traits

**“The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn and relearn.”**

*Alvin Toffler*

### Focus on One Area – Learning Skills

- We are already emphasizing 21<sup>st</sup> Century Skills

1. Complete 5 Sticky Notes each with an instructional strategy/activity that incorporates one of the learning skills
2. Put the Sticky notes on the appropriate poster
3. Gallery Walk to gather ideas, strengths and areas for improvement

- Information & Media Literacy
- Communication Skills
- Critical Thinking & Systems Thinking
- Problem identification, formulation and solution
- Creativity and intellectual curiosity
- Interpersonal and collaborative skills
- Self Direction
- Accountability and Adaptability
- Social Responsibility

### Technology Department

21st Century Resources

- Steffens's Resources
- Greenleaf's Resources
- Teacher Created Resources
- Class Materials
- Ed Tech Grant
- User Network
- Account Form
- WebSense
- Submission
- Internet Configuration
- Security Alert
- Virus Check
- Technology Surveys
- District Tech Plan
- FAQ Page
- 21st Century Resources
- MS Software Home Use Agreement
- Curriculum Mapping

**21st Century Resources**

**Partnership for 21st Century** - The Partnership for 21st Century Skills is the leading advocacy organization focused on infusing 21st century skills into education. The site provides a set of comprehensive tools to help integrate 21st century skills into learning.

**ICT Literacy Maps** - the Partnership for 21st Century Skills developed a series of ICT Literacy Maps illustrating the intersection between Information and Communication Technology (ICT) Literacy and core academic subjects including geography, math, English, and science.

**21st Century Information Fluency Project** - the Illinois Mathematics and Science Academy provides tutorials, wizard tools and resources to help students with digital information fluency.

**21st Century Skills Literacy in the Digital Age** - The North Central Regional Educational Laboratory provides background information on 21st century learners and schools.

**21st Century PowerPoint Presentation Slides handout** - the slides from the PowerPoint presentation in PDF format.

**21st Century Articles**

### Where Do We Go from Here? What YOU can Do?

- Learn more
  - [www.21stcenturyskills.org](http://www.21stcenturyskills.org)
  - [Technology Page - 21st Century Link](#)
  - Work with Tech Coach
  - Involve Peggy
- Focus on 21<sup>st</sup> Century Skills in lesson design
- Enter in Curriculum Mapper
  - School Conversations - Gaps
- Use and Develop ICT Literacy Maps

Address: <http://www.21stcenturyskills.org/>

Links: Administration | ASSET | Google | Library | PBS TeacherLine | Technology | Comcast | Amazon | Hallmark

**PARTNERSHIP FOR 21ST CENTURY SKILLS** • INITIATIVES • PUBLICATIONS • TOOLS • NEWS & EVENTS • ABOUT US

**Assessment Landscape Road to the 21st Century**  
ICT Literacy Maps  
Learning for the 21st Century P21 Snapshot

The leading advocacy organization infusing 21st century skills into education.

**HIGHLIGHTS**  
West Virginia and The Partnership Announce Joint Effort to Focus on 21st Century Skills for Students  
West Virginia Governor Joe Manchin, First Lady Gayle Machin and State Superintendent of Schools Steve Paine announced a joint effort with the Partnership for 21st Century Skills. This effort provides a powerful statewide vision to ensure every child in West Virginia succeeds as a citizen, worker and leader in the 21st century.

**IN THE NEWS**  
The Partnership Hosts Summit on 21st Century Skills and High School Reform: A Practical Guide for Practitioners to be Released in March  
The Partnership for 21st Century Skills hosted the 3rd Annual Summit on 21st Century Skills in November where participants investigated and discussed how 21st century skills and high school reform intersect.

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start