Teachers Discovering Computers

**Integrating Technology and
Digital Media in the Classroom
6th Edition**

Chapter 1

Integrating Educational Technology
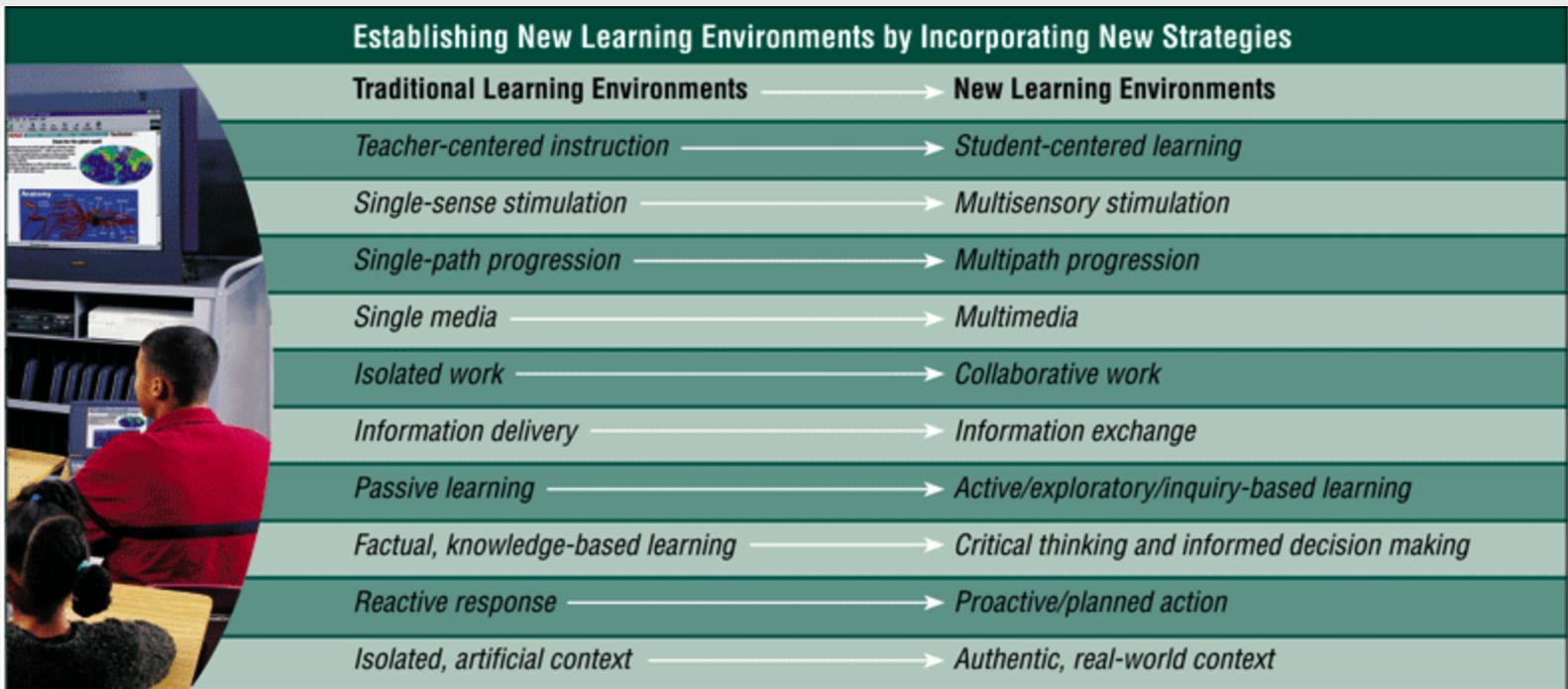into the Curriculum

Chapter Objectives

- Define curriculum-specific learning

- Explain the difference between computer, information, and integration literacy

- Explain the necessity of changing instructional strategies from traditional to new learning environments

- Describe the evolution of computers and digital media

- Differentiate among the various categories of computers

Chapter Objectives

- Explain why computer technology and digital media are important for education

- Describe the National Educational Technology Standards for Teachers (NETS-T) and Students (NETS-S)

- Explain why 21st century skills need to be incorporated in K-12 curriculum

- Describe the characteristics of today's digital students

- Describe six categories of what today's students need to know

- Provide examples of how computers are changing the way people teach and learn

Curriculum-Specific Learning

- Learning how to apply teaching principles, knowledge, and ideas to authentic and practical classroom lessons and projects that can benefit your students

Establishing New Learning Environments by Incorporating New Strategies

Traditional Learning Environments	New Learning Environments
Teacher-centered instruction	Student-centered learning
Single-sense stimulation	Multisensory stimulation
Single-path progression	Multipath progression
Single media	Multimedia
Isolated work	Collaborative work
Information delivery	Information exchange
Passive learning	Active/exploratory/inquiry-based learning
Factual, knowledge-based learning	Critical thinking and informed decision making
Reactive response	Proactive/planned action
Isolated, artificial context	Authentic, real-world context

Source: International Society for Technology in Education (ISTE)

Computer, Information, and Integration Literacy

- Computer literacy
  - Knowledge and understanding of computers and their uses
- Information literacy
  - Knowing how to find, analyze, and communicate information
- Integration literacy
  - The ability to use computers, digital media, and other technologies combined with a variety of teaching and learning strategies to enhance students' learning

Computer, Information, and Integration Literacy

Computer technology and digital media are present in every aspect of daily living — in the workplace, at home, in the classroom, and for entertainment

What Is a Computer and What Does It Do?

- An electronic device, operating under the control of instructions stored in its memory, that can accept data, process the data according to specified rules, produce results, and store the results for future use

- A computer is a computational device

What Is a Computer and What Does It Do?

- Data - collection of unorganized facts
- Information - data that is organized, meaningful, and useful
- Input - data entered into a computer
- Output - processed results from a computer
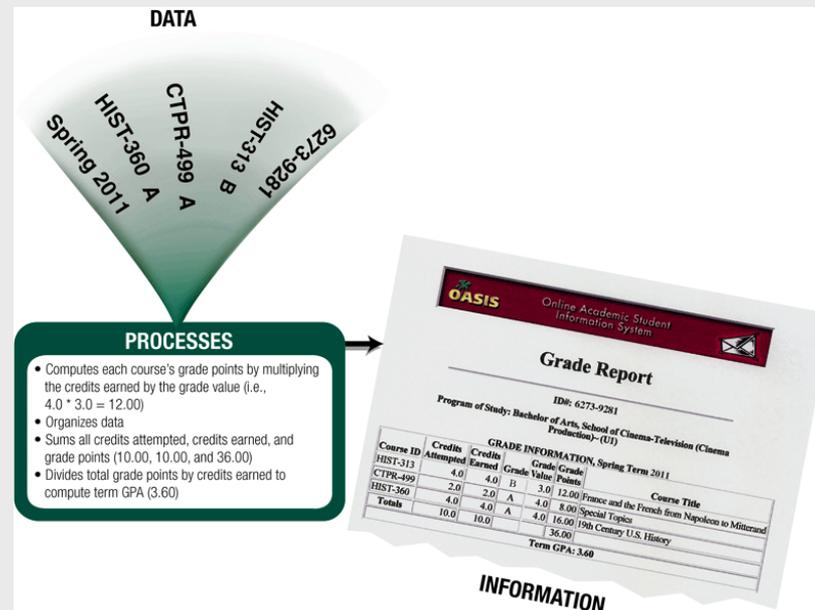
What Is a Computer and What Does It Do?

- Storage – holding data and information for future use

- Information processing cycle – the cycle of input, process, output, and storage

- Hardware – the electronic and mechanical equipment that makes up the computer

- Software – a series of instructions that tells the hardware how to perform tasks

The Evolution of Computers and Digital Media

- The goal of multimedia computing and communications is to assist individuals in organizing and managing vast amounts of information in various types of media

- Digital media – technologies that allow users to create new forms of interaction, expression, communication, and entertainment in a digital format

The Evolution of Computers and Digital Media

Categories of Computers

- Personal computers
- Mobile computers and mobile devices
- Game consoles
- Servers, supercomputers, and embedded computers

Personal Computers

- A computer that performs all of its input, processing, output, and storage activities by itself

[a]

[b]

Mobile Computers and Mobile Devices

- Mobile Computers
  - Notebook computer
  - Tablet PC
  - Netbook
- Mobile Devices
  - Handheld Computer
  - PDA
  - Smartphones

[a]

[b]

[a]

[b]

Game Consoles

- Mobile computing device designed for single player or multiplayer video games

- Controller is the input device

- Television is the output device

- Hard Disks, CDs, DVDs, and memory cards are used for storage

Servers, Supercomputers, and Embedded Computers

- Server
  - Manages the resources on a network and provides a centralized storage area for software programs and data
- Supercomputer
  - Used for tasks such as analyzing weather patterns, tracking hurricanes, and identifying safety issues regarding the space shuttle
- Embedded computer
  - A special-purpose computer that functions as one component in a larger product

Why Use Computer Technology in Education?

- Technology and digital media are everywhere
- Technology can support learning
- Computers support communications beyond classroom walls
- Support of national and international organizations

Why Use Computer Technology in Education?

The World Is Flat

- *The World Is Flat*
  - Lightning-swift changes in technology and communications put people all over the globe in touch with each other as never before

21ˢᵗ Century Skills

Computing in the Digital Age

- Digital Students: Who are they and how do they learn?
  - Digital generations – students use different technologies to communicate and to access information from multiple resources
  - Digital students (digital kids)
    - Hypercommunicators
    - Multitaskers
    - Goal oriented

Computing in the Digital Age

Understanding Today's Digital Generation

Students from Previous Generations	Today's Digital Students
Passive communicators	Hypercommunicators
Single taskers	Multitaskers
Work oriented	Play oriented
Linear thinking	Random access
Nonrelevancy learning — relevancy was not critical to learning	Learning has to be relevant and fun
Single sensory input	Multisensory input
Text-based first	Digital and graphics first
Reality-based	Fantasy-based learning
Conventional speed	Twitch speed

Computing in the Digital Age

- Digital Students: What they should know
  - Creativity and innovation

Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology. Students:

a. apply existing knowledge to generate new ideas, products, or processes.

b. create original works as a means of personal or group expression.

c. use models and simulations to explore complex systems and issues.

d. identify trends and forecast possibilities.

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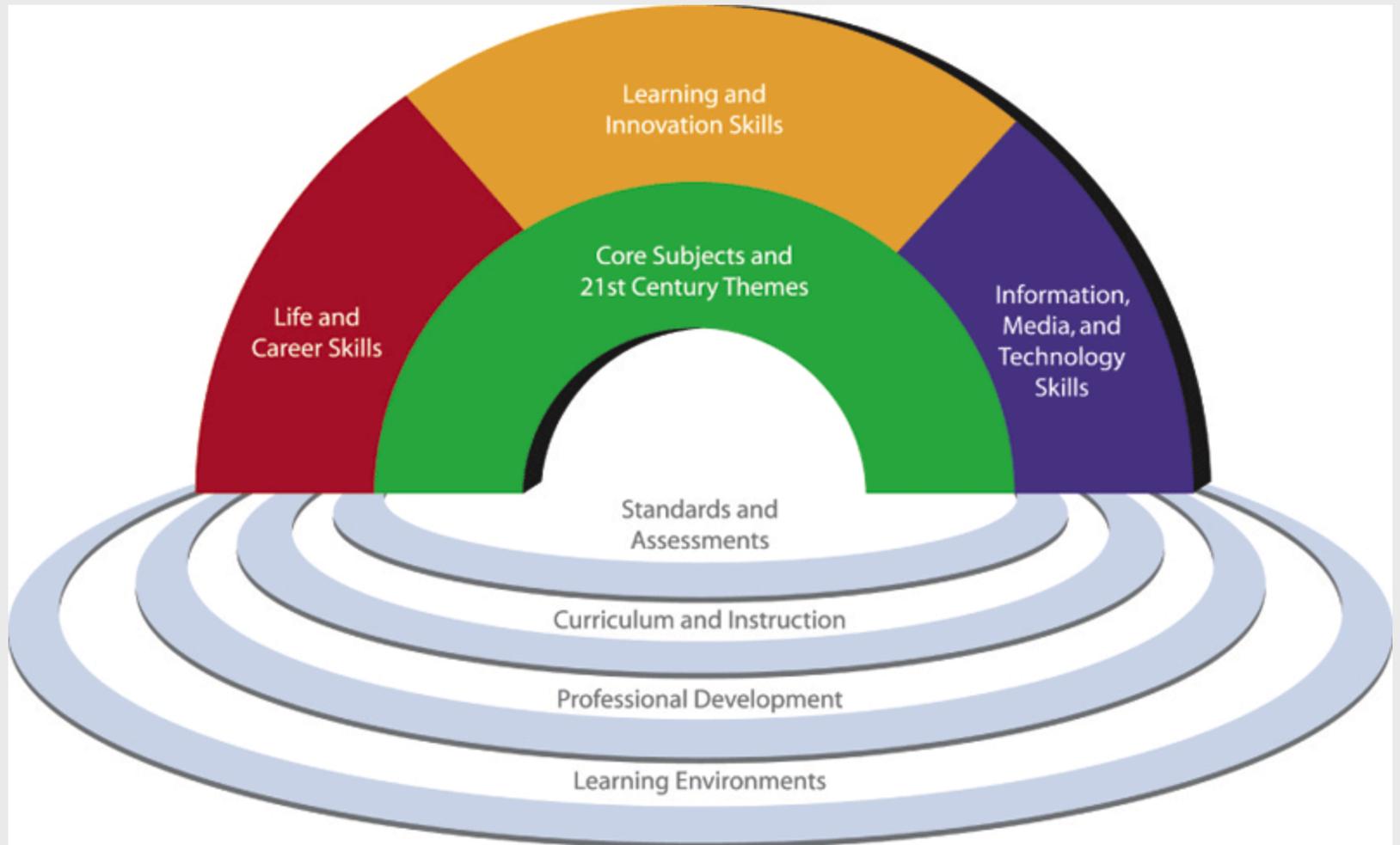
Computing in the Digital Age

- Gamemaker is an example of a software program that allows students to create video games while fostering opportunities for creativity and innovation

Computing in the Digital Age

- Digital Students: What they should know
  - Communications and collaboration

Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others. Students:

a. interact, collaborate, and publish with peers, experts or others employing a variety of digital environments and media.

b. communicate information and ideas effectively to multiple audiences using a variety of media and formats.

c. develop cultural understanding and global awareness by engaging with learners of other cultures.

d. contribute to project teams to produce original works or solve problems.

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Computing in the Digital Age

- Digital Students: What they should know
  - Research and Information Fluency
    - Information fluency is when a person has mastered the ability to analyze and evaluate information

Students apply digital tools to gather, evaluate, and use information. Students:

a. plan strategies to guide inquiry.

b. locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media.

c. evaluate and select information sources and digital tools based on the appropriateness to specific tasks.

d. process data and report results.

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Computing in the Digital Age

- Digital Students: What they should know
  - Critical thinking, problem solving, & decision making

Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources. Students:

a. identify and define authentic problems and significant questions for investigation.

b. plan and manage activities to develop a solution or complete a project.

c. collect and analyze data to identify solutions and/or make informed decisions.

d. use multiple processes and diverse perspectives to explore alternative solutions.

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Computing in the Digital Age

- Digital Students: What they should know
  - Digital Citizenship

Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior. Students:

a. advocate and practice safe, legal, and responsible use of information and technology.

b. exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity.

c. demonstrate personal responsibility for lifelong learning.

d. exhibit leadership for digital citizenship.

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Computing in the Digital Age

- Digital Students: What they should know
  - Technology operations and concepts

Students demonstrate a sound understanding of technology concepts, systems, and operations. Students:

a. understand and use technology systems.

b. select and use applications effectively and productively.

c. troubleshoot systems and applications.

d. transfer current knowledge to learning of new technologies.

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Computing in the Digital Age

- ARCS motivational model
  - Developed in 1983 and applicable to learning in the digital age
    - Attention
    - Relevance
    - Challenge/Confidence
    - Satisfaction/Success

Computing in the Digital Age
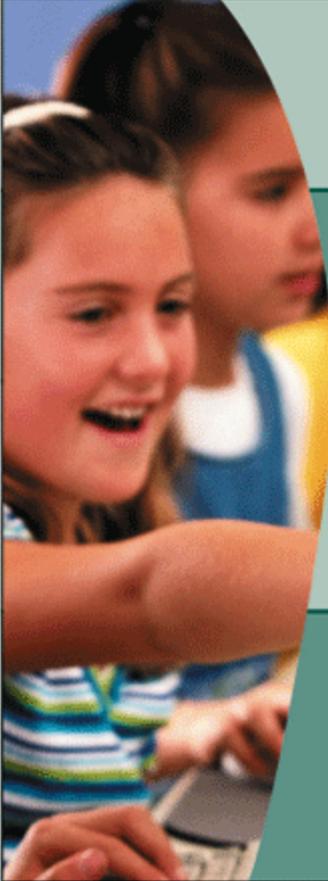
The ARCS Motivational Model and Digital Students

|	
Attention	Lessons are designed to gain students' attention using alternative techniques, such as a story, sensory stimuli, thought-provoking questions, and variability in exercises, and using digital media.
Relevance	Students see relevance in the lesson, which, in turn, leads to increased learning. The lesson must be relevant not only to the learner, but also to previously taught lessons.
Challenge/Confidence	Students are challenged to achieve, and they gain confidence as they meet the challenge. Students need to feel that if they put in a good faith effort, they are capable of achieving the objectives. The challenge should properly match the students' abilities.
Satisfaction/Success	Students gain success in achieving their objective, which promotes self-satisfaction from the learning experience. The most powerful reward is that the students find that the learning experience is relevant and useful to their own world or the one they aspire to live and work in.

An Example of How One School Uses Computers

- Ridgedale High School
  - All computers on a local area network
  - Three labs of 30 computers each
    - PCs and Macs
  - High-speed Internet connection in each classroom

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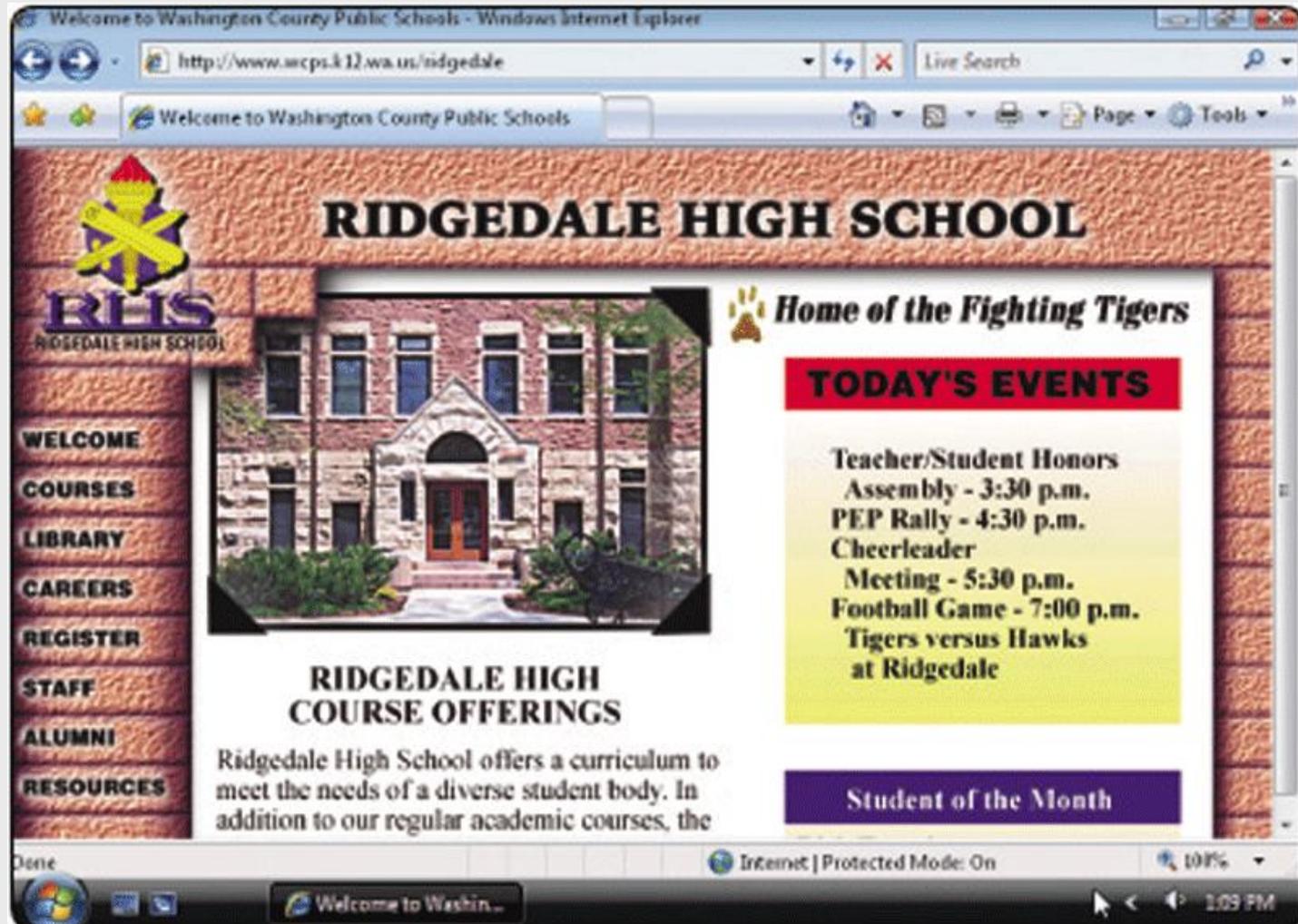
An Example of How One School Uses Computers

- Superintendent
  - Technology plan
  - Committee members can access the plan remotely

An Example of How One School Uses Computers

- Principal
    - Sending several text and e-mail messages to teachers and staff
    - Research on digital storytelling

An Example of How One School Uses Computers

- School secretary
  - Computerized telephone system
  - E-mail and voice mail
  - Teacher database
  - School inventory database
  - Desktop publishing

An Example of How One School Uses Computers

- Technology coordinator
  - Installing and testing new software
  - Supporting systems
  - Problem solving

An Example of How One School Uses Computers

- Teachers
  - Community digital storytelling
  - Transmedia story
  - Research assignments
  - Wireless mobile lab
  - Network stores student data

An Example of How One School Uses Computers

- Media specialist
  - Maintains online catalog
  - Creates classroom activities
  - Runs media center
  - Assists with research projects

An Example of How One School Uses Computers

- Students
    - Live broadcast of *Ridgedale News Show*
    - Talking, texting, and instant messaging about digital storytelling projects
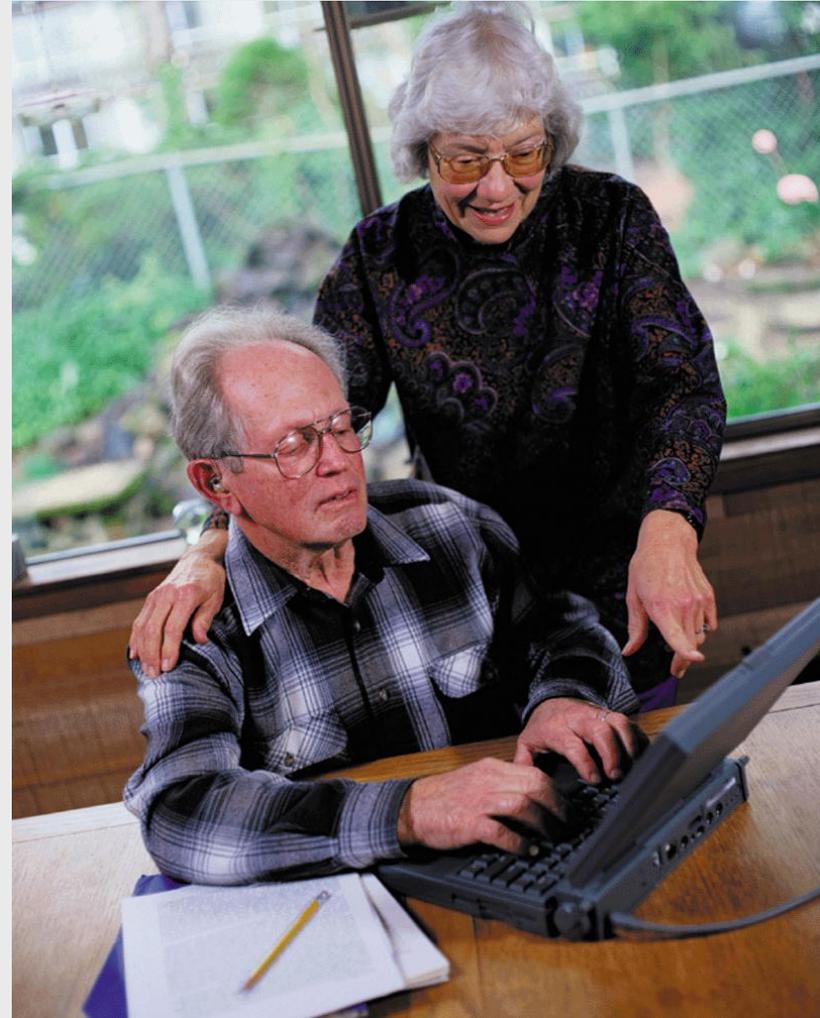
An Example of How One School Uses Computers

- Parent
    - Web site links parents and school
    - Keep track of events
    - School information

An Example of How One School Uses Computers

- Community
  - Links school and community
  - Students teach senior citizens how to use a computer

Chapter Summary

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Chapter 1 Complete

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