21st Century Skills

Cross-Match to National Models

National Educational Technology Standards (NETS) for Students (2000)

By the International Society for Technology in Education (ISTE): cnets.iste.org/students/s_book.html.

First released in 1998 after five years of development and extensive input from educators across the nation, the National Educational Technology Standards for Students (NETS) are the de facto standard for most schools today. ISTE has since built extensive curriculum guides and teacher standards based on these standards.

Compared to *enGauge* 21st Century Skills, the ISTE standards do not specifically address Visual Literacy, Global Awareness, Adaptability/Managing Complexity, Curiosity, or Risk-Taking.

ISTE NETS	*enGauge* 21st Century Skills
1. Basic Operations and Concepts	
• Students demonstrate a sound understanding of the nature and operation of technology systems.	• Technological Literacy
• Students are proficient in the use of technology.	• Technological Literacy
2. Social, Ethical, and Human Issues	
• Students understand the ethical, cultural, and societal issues related to technology.	• Multicultural Literacy • Social and Civic Responsibility
• Students practice responsible use of technology systems, information, and software.	• Personal Responsibility • Social and Civic Responsibility
• Students develop positive attitudes	• Teaming and

toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.	Collaboration • Effective Use of Real-World Tools
3. Technology Productivity Tools	
• Students use technology tools to enhance learning, increase productivity, and promote creativity.	• Information Literacy • Creativity
• Students use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.	• Relevant, High-Quality Products • Prioritizing, Planning, and Managing for Results • Teaming and Collaboration
4. Technology Communications Tools	
• Students use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences.	• Interactive Communications
• Students use a variety of media and formats to communicate information and ideas effectively to multiple audiences.	• Information Literacy • Interactive Communication
5. Technology Research Tools	
• Students use technology to locate, evaluate, and collect information from a variety of sources.	• Information Literacy • Economic Literacy
• Students use technology tools to process data and report results.	• Scientific Literacy • Information Literacy • Economic Literacy
• Students evaluate and select new information resources and technological innovations based on the	• Information Literacy • Effective Use of

appropriateness to specific tasks.	Real-World Tools
6. Technology Problem-Solving and Decision-Making Tools	
• Students use technology resources for solving problems and making informed decisions.	• Higher-Order Thinking and Sound Reasoning
• Students employ technology in the development of strategies for solving problems in the real world.	• Economic Literacy • Higher-Order Thinking and Sound Reasoning • Effective Use of Real-World Tools

International Society for Technology in Education. (2000). *National educational technology standards for students: Connecting curriculum and technology.* Eugene, OR: Author.

http://www.ncrel.org/engauge/skills/match.htm

What Work Requires of Schools (1991)

By the U.S. Department of Labor:
http://wdr.doleta.gov/SCANS/whatwork/whatwork.html.

In 1991 the Secretary's Commission on Achieving Necessary Skills (SCANS) published skills that were required to enter the workplace successfully. SCANS identified workplace know-how that defined effective job performance. The list had two elements: five competencies and a three-part foundation of skills and personal qualities.

Compared to *enGauge* 21st Century Skills, the SCANS proficiencies do not explicitly address Multicultural Literacy, Global Awareness, aspects of Interactive Communication and Visual Literacy, or High-Quality Results.

SCANS		***enGauge* 21st Century Skills**
Five Competencies		
• Resources: Identifies, organizes, plans and allocates resources	A. Time B. Money C. Material and Facilities D. Human Resources	• Adaptability/Managing Complexity • Economic Literacy
• Interpersonal: Works with others	A. Participates as Member of a Team B. Teaches Others New Skills C. Serves Clients/Customers D. Exercises Leadership E. Negotiates F. Works with Diversity	• Teaming and Collaboration • Self-Direction • Multicultural Literacy
• Information: Acquires and uses information	A. Acquires and Evaluates Information B. Organizes and Maintains Information C. Interprets and Communicates Information D. Uses Computers to	• Information Literacy • Economic Literacy • Interactive Communication

	Process Information	
• Systems: Understands complex inter-relationships	A. Understands Systems B. Monitors and Corrects Performance C. Improves or Designs Systems	• Scientific Literacy • Economic Literacy • Adaptability/Managing Complexity • Prioritizing, Planning, and Managing for Results
• Technology: Works with a variety of technologies	A. Selects Technology B. Applies Technology to Task C. Maintains and Troubleshoots Equipment	• Effective Use of Real-World Tools • Technological Literacy
A Three-Part Foundation		
• Basics Skills: Reads, writes, performs arithmetic and mathematical operations, listens, and speaks	A. Reading B. Writing C. Arithmetic/Mathematics D. Listening E. Speaking	• Basic Literacy • Scientific Literacy
• Thinking Skills: Thinks creatively, makes decisions, solves problems, visualizes, knows how to learn, and reasons	A. Creative Thinking B. Decision Making Reasoning C. Problem Solving D. Seeing Things in the Mind's Eye E. Knowing How to Learn F. Reasoning	• Higher-Order Thinking and Sound Reasoning • Visual Literacy • Curiosity • Creativity
• Personal	A. Responsibility	• Teaming and

Qualities: Displays responsibility, self-esteem, sociability, self-management, and integrity and honesty	B. Self-Esteem C. Sociability D. Self-Management E. Integrity/Honesty	Collaboration • Self-Direction • Personal Responsibility • Social and Civic Responsibility

Secretary's Commission on Achieving Necessary Skills. (1991). *What work requires of schools: A SCANS report for America: 2000*. Washington, DC: U.S. Department of Labor.

http://www.ncrel.org/engauge/skills/match1.htm

Information Literacy Standards for Student Learning (1998)

By the American Association of School Librarians and the Association for Educational Communications and Technology: www.ala.org/aasl/ip_nine.html

The Information Literacy Standards were developed as a foundation upon which to base lifelong learning. Prepared by the American Association of School Librarians (AASL) and the Association for Educational Communications and Technology (AECT), they have been widely promoted by the American Library Association. The nine standards fall into three categories: information literacy, independent learning, and social responsibility.

Compared to the *enGauge* 21st Century Skills, the AASL and AECT standards address student skills from the perspective of a library media specialist. The *enGauge* 21st Century Skills are broader in scope, including such areas as Scientific Literacy, Visual Literacy, Multicultural Literacy, Global Awareness, Interactive Communication, Risk-Taking, and High- Quality Results.

Information Literacy Standards	***enGauge* 21st Century Skills**
Information Literacy	
• Standard 1: The student who is information literate accesses information efficiently and effectively.	• Basic and Information Literacy
• Standard 2: The student who is information literate evaluates information critically and competently.	• Information Literacy • Economic Literacy • Higher-Order Thinking and Sound Reasoning
• Standard 3: The student who is information literate uses information accurately and creatively.	• Information Literacy • Creativity • Effective Use of Real-World Tools
Independent Learning	
• Standard 4: The student who is an independent learner is information literate and pursues information related	• Information Literacy • Self-Direction

to personal interests.	• Curiosity
• Standard 5: The student who is an independent learner is information literate and appreciates literature and other creative expressions of information.	• Visual Literacy • Information Literacy
• Standard 6: The student who is an independent learner is information literate and strives for excellence in information seeking and knowledge generation.	• Information Literacy • Effective Use of Real-World Tools • Relevant, High-Quality Products
Social Responsibility	
• Standard 7: The student who contributes positively to the learning community and to society is information literate and recognizes the importance of information to a democratic society.	• Social and Civic Responsibility • Technological Literacy • Economic Literacy
• Standard 8: The student who contributes positively to the learning community and to society is information literate and practices ethical behavior in regard to information and information technology.	• Information Literacy • Personal Responsibility • Social and Civic Responsibility • Technological Literacy
• Standard 9: The student who contributes positively to the learning community and to society is information literate and participates effectively in groups to pursue and generate information.	• Information Literacy • Teaming and Collaboration • Social and Civic Responsibility • Prioritizing, Planning, and Managing for Results

American Association of School Librarians & Association for Educational Communications and Technology. (1998). *Information literacy standards for student learning.* Chicago: American Library Association. http://www.ncrel.org/engauge/skills/match2.htm

Technically Speaking: Why All Americans Need to Know More About Technology (2002)

By the National Academy of Engineering (NAE) and the National Research Council (NRC): www.nap.edu/books/0309082625/html/.

This Committee for Technological Literacy was charged with developing a vision for technological literacy in the United States and recommending ways to achieve that vision. The project was funded by the National Science Foundation (NSF) and the Battelle Memorial Institute.

Compared to *enGauge* 21st Century Skills, the focus for this committee's work is on Technological Literacy, just one of the skills included in the *enGauge* 21st Century Skill set. Nevertheless, the following match can be made:

Technically Speaking	***enGauge* 21st Century Skills**
Characteristics of a Technologically Literate Citizen	
Knowledge	
• Recognizes the pervasive presence of technology in everyday life.	• Technological Literacy
• Understands basic engineering concepts and terms, such as systems, constraints, and trade-offs.	• Scientific Literacy
• Is familiar with the nature and limitations of the engineering design process	• Scientific Literacy
• Knows some of the ways technology shapes human history and people shape technology	• Multicultural Literacy
• Knows that all technologies entail risk, some that can be anticipated and some that cannot.	• Prioritizing, Planning, and Managing for Results
• Appreciates that the development and use of technology involving trade-offs	• Economic Literacy • Prioritizing, Planning, and

and a balance of costs and benefits.	Managing for Results
• Understands that technology reflects the values and culture of society.	• Multicultural Literacy
Ways of Thinking and Acting	
• Asks pertinent questions, of self and others, regarding the benefits and risks of technology.	• Self-Direction • Technological Literacy • Economic Literacy
• Seeks information about new technologies.	• Curiosity • Technological Literacy
• Participates, when appropriate, in decisions about the development and use of technology.	• Social and Civic Responsibility
Capabilities	
• Has a range of hands-on skills, such as using a computer for word processing and surfing the Internet and operating a variety of home and office appliances.	• Technological Literacy
• Can identify and fix simple mechanical or technological problems at home or work.	• Technological Literacy
• Can apply basic mathematical concepts related to probability, scale, and estimation to make informed judgments about technological risks and benefits.	• Scientific Literacy

National Academy of Engineering: Committee on Technological Literacy. (2002). *Technically speaking: Why all Americans need to know more about technology.* Washington, DC: National Academy Press.

http://www.ncrel.org/engauge/skills/match3.htm

Standards for Technological Literacy (2000)

By the International Technology Education Association (ITEA): www.iteawww.org/TAA/PDFs/xstnd.pdf.

These standards were developed by the Technology for All Americans Project to promote the study of technology and technological literacy. Compared to the *enGauge* 21st Century Skills, these skills focus on classes specializing in the study of technology as a topic. Nevertheless, the following match can be made:

Technological Literacy	***enGauge* 21st Century Skills**
The Nature of Technology	
• Standard 1: Students will develop an understanding of the characteristics and scope of technology.	• Technological Literacy • Scientific Literacy
• Standard 2: Students will develop an understanding of the core concepts of technology.	
• Standard 3: Students will develop an understanding of the relationships among technologies and the connections between technology and other fields of study.	
Technology and Society	
• Standard 4: Students will develop an understanding of the cultural, social, economic, and political effects of technology.	• Multicultural Literacy • Technological Literacy • Economic Literacy
• Standard 5: Students will develop an understanding of the effects of technology on the environment.	• Scientific Literacy • Social and Civic Responsibility
• Standard 6: Students will develop an understanding of the role of society in the development and use of technology.	• Technological Literacy • Social and Civic Responsibility

• Standard 7: Students will develop an understanding of the influence of technology on history.	• Technological Literacy
Design	
• Standard 8: Students will develop an understanding of the attributes of design.	• Relevant, High-Quality Products
• Standard 9: Students will develop an understanding of engineering design.	• Scientific Literacy
• Standard 10: Students will develop an understanding of the role of troubleshooting, research and development, invention and innovation, Sound Reasoning	• Higher-Order Thinking and and experimentation in problem solving. • Creativity
Abilities for a Technological World	
• Standard 11: Students will develop abilities to apply the design process.	• Effective Use of Real-World Tools
• Standard 12: Students will develop abilities to use and maintain technological products and systems.	• Technological Literacy
• Standard 13: Students will develop abilities to assess the impact of products and systems.	• Relevant, High-Quality Products
The Designed World	
• Standard 14: Students will develop an understanding of and be able to select and use medical technologies.	• Technological Literacy • Effective Use of Real-World Tools • Scientific Literacy • Economic Literacy • Interactive Communication • Social and Civic
• Standard 15: Students will develop an understanding of and be able to select and use agricultural and	

related biotechnologies.	Responsibility
• Standard 16: Students will develop an understanding of and be able to select and use energy and power technologies.	
• Standard 17: Students will develop an understanding of and be able to select and use information and communication technologies.	
• Standard 18: Students will develop an understanding of and be able to select and use transportation technologies.	
• Standard 19: Students will develop an understanding of and be able to select and use manufacturing technologies.	
• Standard 20: Students will develop an understanding of and be able to select and use construction technologies.	

International Technology Education Association (2000). Standards for technological literacy: Content for the study of technology. Reston, VA: Author. Available at: www.iteawww.org/TAA/PDFs/xstnd.pdf.

	NETS ISTE	What Work Requires SCANS	Information Literacy AASL and AECT	Technically Speaking NAE/NRC	Technological Literacy ITEA
Digital-Age Literacy					
• **Basic Literacy**		**X**	**X**		
• **Scientific**		**X**		**X**	**X**

Literacy					
• **Technological Literacy**	**X**	**X**	**X**	**X**	**X**
• **Economic Literacy**	**X**	**X**	**X**	**X**	**X**
• **Visual Literacy**		**X**	**X**		
• **Information Literacy**	**X**	**X**	**X**		
• **Multicultural Literacy**	**X**	**X**		**X**	**X**
• **Global Awareness**					
Inventive Thinking					
• **Adaptability and Managing Complexity**		**X**			
• **Self-Direction**		**X**	**X**	**X**	
• **Curiosity**		**X**		**X**	
• **Creativity**	**X**	**X**	**X**		**X**
• **Risk Taking**					
• **Higher-Order Thinking and Sound Reasoning**	**X**	**X**	**X**		**X**
Effective Communication					

• **Teaming and Collaboration**	X	X	X		
• **Interpersonal Skills**		X			
• **Personal Responsibility**	X	X	X		
• **Social and Civic Responsibility**	X	X	X	X	
• **Interactive Communication**	X	X			X
High Productivity					
• **Prioritizing, Planning, and Managing for Results**	X	X	X	X	
• **Effective Use of Real-World Tools**	X	X	X	X	
• **Ability to Produce Relevant, High-Quality Products**	X		X		X

http://www.ncrel.org/engauge/skills/match4.htm