

# Dutchess County Education Technology Standards for Students Guidelines

## Introduction

This document is designed to provide Dutchess County teachers, administrators, school boards, and school community members with guidelines and standards to assist them in establishing comprehensive, multi-year, school improvement plans which include enriched learning environments supported by technology. State and Federal regulations for school aid and grant monies require educational institutions to engage students in activities that integrate technology in relevant curricula. The K-12 standards listed here reflect and support the New York State Learning Standards and new assessments.

The next step for the Dutchess County Curriculum & Assessment, Integrating Technology (CAIT) Council is the development of evaluation tools to measure the effective use of technology in teaching and learning.

## Conditions Essential for Successful Technology-Rich Learning Environments

Physical, human, financial, and policy decisions greatly affect the success of technology use in schools. The following conditions are necessary in educational communities to effectively use technology for learning, teaching, and educational management:

- Vision with support & proactive leadership from the educational system
- Policies & standards supporting new learning environments
- Educators skilled in the use of technology for learning
- Content standards & curriculum resources
- Student-centered approaches to learning
- Access to contemporary technologies, software, and telecommunications networks
- Technical assistance for maintaining & using technology resources
- Community partners who provide expertise, support, & real-life interactions
- Ongoing financial support for sustained technology use

## Establishing New Learning Environments

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 .....	Critical thinking & informed decision-making
Reactive response .....	Proactive/planned action
Isolated, artificial context .....	Authentic, real-world context

To learn, live, and work successfully in an increasingly complex and information-rich society, students must use technology effectively. Within a sound educational setting, technology will enable students to:

- Communicate using a variety of media & formats
- Access & exchange information in a variety of ways
- Compile, organize, analyze, & synthesize information
- Draw conclusions & make generalizations based on information gathered
- Use information & select appropriate tools to solve problems
- Know content & be able to locate information as needed
- Become self-directed learners
- Collaborate & cooperate in team efforts
- Interact with others in ethical & appropriate ways

## Dutchess County Technology Standards for Students

Dutchess County technology standards for students are divided into the following six broad categories. Standards within each category are to be introduced, reinforced, and mastered by students. These categories provide a framework for linking performance indicators found within the Profiles for Technology Literate Students to the standards. Teachers can use these standards and profiles as guidelines for planning technology-based activities in which students achieve success in learning, communication, and life skills.

### 1. Basic Operations and Concepts

Students demonstrate a sound understanding of the nature and operation of technology systems.  
Students are proficient in the use of technology.

### 2. Social, Ethical, and Human Issues

Students understand the ethical, cultural, and societal issues related to technology.  
Students practice responsible use of technology systems, information, and software.  
Students develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

### 3. Technology Productivity Tools

Students use technology tools to enhance learning, increase productivity, and promote creativity.  
Students use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

### 4. Technology Communications Tools

Students use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences.  
Students use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

### 5. Technology Research Tools

Students use technology to locate, evaluate, and collect information from a variety of sources.  
Students use technology tools to process data and report results.  
Students evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

### 6. Technology Problem-Solving and Decision-Making Tools

Students use technology resources for solving problems and making informed decisions.  
Students employ technology in the development of strategies for solving problems in the real world.

GRADES Pre K - 2  
Profile for Technology Literate Students

Performance Indicators:

All students should have opportunities to demonstrate the following performances. Numbers in parentheses following each performance indicator refer to the standards category to which the performance is linked.

The categories are:

1. Basic Operations and Concepts
2. Social, Ethical, and Human Issues
3. Technology Productivity Tools
4. Technology Communications Tools
5. Technology Research Tools
6. Technology Problem-Solving and Decision-Making Tools

Prior to completion of Grade 2 students will:

1. Use input devices (e.g., mouse, keyboard, remote control) and output devices (e.g., including adaptive devices when necessary monitor, printer) to successfully operate computers, VCRs, audio tapes, and other technologies. (1)
2. Use a variety of media and technology resources for directed and independent learning activities. (1, 3)
3. Communicate about technology using developmentally appropriate and accurate terminology. (1)
4. Use developmentally appropriate multimedia resources (e.g., interactive books, educational software, elementary multimedia encyclopedias) to support learning. (1)
5. Work cooperatively and collaboratively when using technology. (2)
6. Practice positive social and ethical behaviors when using technology. (2)
7. Practice responsible use of technology systems and software. (1)
8. Create developmentally appropriate multimedia products. (3)
9. Use technology resources (e.g., puzzles, logical thinking programs, writing tools, digital cameras, drawing tools) for problem solving, communication, and illustration of thoughts, ideas, and stories. (3, 4, 5, 6)
10. Gather information and communicate with others using telecommunications. (4)

GRADES 3 - 5  
Profile for Technology Literate Students

Performance Indicators:

All students should have opportunities to demonstrate the following performances. Numbers in parentheses following each performance indicator refer to the standards category to which the performance is linked.

The categories are:

1. Basic Operations and Concepts
2. Social, Ethical, and Human Issues
3. Technology Productivity Tools
4. Technology Communications Tools
5. Technology Research Tools
6. Technology Problem-Solving and Decision-Making Tools

Prior to completion of Grade 5 students will:

1. Use keyboards and other common input and output devices (including adaptive devices when necessary) efficiently and effectively. (1)
2. Articulate common uses of technology in daily life and the advantages and disadvantages those uses provide. (1, 2)
3. Articulate basic issues (e.g., copyright laws) related to responsible use of technology and information and describe personal consequences of inappropriate use. (2)
4. Use general-purpose productivity tools to support personal productivity, remediate skill deficits, and facilitate learning throughout the curriculum. (3)
5. Use multimedia-authoring, presentation, Web tools, digital cameras, scanners, etc. for individual and collaborative writing, communication, and publishing activities to create & share knowledge products for audiences inside and outside the classroom. (3, 4)
6. Use telecommunications efficiently and effectively to access information, communicate with others in support of direct and independent learning, and pursue personal interests. (4)
7. Use telecommunications and online resources (e.g., e-mail, online discussions, Web environments) to participate in collaborative problem-solving activities for the purpose of developing & sharing solutions or products for audiences inside and outside the classroom. (4, 5)
8. Use technology resources (e.g., calculators, data collection probes, videos, educational software) for problem-solving, self-directed learning, and extended learning activities. (5, 6)
9. Determine when technology is useful (as well as when it is not) and select the appropriate tool(s) and technology resources to address a variety of tasks and problems. (5, 6)
10. Evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources. (6)

GRADES 6 - 8  
Profile for Technology Literate Students

Performance Indicators:

All students should have opportunities to demonstrate the following performances. Numbers in parentheses following each performance indicator refer to the standards category to which the performance is linked.

The categories are:

1. Basic Operations and Concepts
2. Social, Ethical, and Human Issues
3. Technology Productivity Tools
4. Technology Communications Tools
5. Technology Research Tools
6. Technology Problem-Solving and Decision-Making Tools

Prior to completion of Grade 8 students will:

1. Demonstrate an understanding of concepts underlying hardware, software, and connectivity, and of practical applications to learning and problem solving. (1, 6)
2. Demonstrate knowledge of current changes in information technologies and the effect those changes have on the workplace and society. (2)
3. Exhibit safe, legal, and ethical behaviors (including respect for copyright laws) when using information and technology, and discuss consequences of misuse. (2)
4. Use content-specific tools, software, and simulations (e.g., environmental probes, graphing calculators, exploratory environments, Web tools) to support learning and research. (3, 5)
5. Apply productivity/multimedia tools to support personal productivity, group collaboration, and learning throughout the curriculum. (3, 6)
6. Design, develop, publish, and present products (e.g., Web pages, videotapes) using technology resources that demonstrate and communicate curriculum concepts to audiences inside and outside the classroom. (4, 5, 6)
7. Collaborate with peers, experts, and others using telecommunications and collaborative tools to investigate curriculum-related problems, issues, and information, and to develop solutions or products for audiences inside and outside the classroom. (4, 5)
8. Select and use appropriate tools and technology resources to accomplish a variety of tasks and solve problems. (5, 6)
9. Research and evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources concerning real-world problems. (2, 5, 6)

**GRADES 9 - 12**  
**Profile for Technology Literate Students**

Performance Indicators:

All students should have opportunities to demonstrate the following performances.

Numbers in parentheses following each performance indicator refer to the standards category to which the performance is linked.

The categories are:

1. Basic Operations and Concepts
2. Social, Ethical, and Human Issues
3. Technology Productivity Tools
4. Technology Communications Tools
5. Technology Research Tools
6. Technology Problem-Solving and Decision-Making Tools

Prior to completion of Grade 12 students will:

1. Identify capabilities and limitations of contemporary and emerging technology resources and assess the potential of these systems and services to address personal, lifelong learning, and workplace needs. (2)
2. Analyze advantages and disadvantages of widespread use and reliance of technology in the workplace and in society as a whole. (2)
3. Demonstrate legal and ethical behaviors regarding the use of technology and information. (2)
4. Use technology tools and resources for managing and communicating personal/professional information (e.g., finances, schedules, addresses, purchases, correspondence). (3, 4)
5. Evaluate technology-based options for lifelong learning. (5)
6. Efficiently and routinely use online information resources to meet needs for collaboration, research, publications, communications, and productivity. (4, 5, 6)
7. Select and apply technology tools for research, information analysis, problem solving, and decision-making in content learning. (4, 5)
8. Collaborate with peers, experts, and others to contribute to a content-related knowledge base by using technology to compile, synthesize, produce, and disseminate information, models, and other creative works. (4, 5, 6)

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