# Hillsdale Public Schools
# Hillsdale, New Jersey


# Technology Literacy Curriculum Guide
# Pre-K - 8
# 2011

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# INTRODUCTION

The Hillsdale School System's Technology Literacy program is designed to build awareness and knowledge that will provide our students with the lifelong technology skills as well as communication and information sharing abilities necessary for today's technological world. These skills should not be learned in isolation but rather through infusion into all areas of the curriculum. They need to be developed in sequence beginning at the earliest grade level and in support of all core content areas. This curriculum guide is therefore intended for use by teachers of all grade levels and all disciplines.

## *We accept the state's definition of the discipline:*

Technology enables students to solve real world problems, enhance life, and extend human capability as they meet the challenges of a dynamic global society.
The systematic integration of technology across the curriculum and in the teaching and learning process fosters a population that leverages 21st century resources to:

- Apply information-literacy skills to access, manage, and communicate information using a range of emerging technological tools.
- Think critically and creatively to solve problems, synthesize and create new knowledge, and make informed decisions that affect individuals, the world community, and the environment.
- Gain enhanced understanding of global interdependencies as well as multiple cultural perspectives, differing points of view, and diverse values.
- Employ a systemic approach to understand the design process, the designed world, and the interrelationship and impact of technologies.
- Model digital citizenship.

The suggested strategies and resources presented below are only suggestions as to the resources teachers may use in instructing students to meet the objectives of the curriculum. The actual resources used in the classroom may differ from the resources mentioned in this curriculum. In addition because of the ever changing field of technology, it should be noted that this curriculum is continuously evolving to keep pace. Therefore, in-service programs designed to help teachers update and enhance instruction are paramount in facilitating student progress.

"New Jersey Department of Education." The Official Web Site for The State of New Jersey. July 7,2011: https://www13.state.nj.us/NJCCCS/ContentAreaTableView_Technology.aspx

# OVERVIEW OF CURRICULUM STANDARDS AS EXPRESSED BY THE STATE OF NEW JERSEY

In **Preschool**, technology offers versatile learning tools that can support children's development in all domains. For example, electronic storybooks can "read" stories to children in multiple languages; adventure games foster problem-solving skills; story-making programs encourage literacy and creativity; math-related games can help children count and classify; and science activities promote inquiry and an understanding of the world through the eyes of a child. When preschoolers are encouraged to work together with electronic devices and computers, social skills are tapped as children negotiate turn-taking. However, technology should not replace the concrete, real-life experiences that are critical to a young child's learning; it must always be used in balance with other meaningful activities and routines. Technology should be embedded into children's learning centers and should enhance their learning and development during choice time as well as in small-group experiences.

In grades **K-2**, students are formally introduced to the basic features and functions of computers and demonstrate understanding that technology enables them to communicate beyond the classroom on a variety of topics. K-2 students are also exposed to elements of the design process, design systems, and a variety of technology resources, and understand the importance of safety when using technological tools.

In grades **3-4**, students understand the purpose of, and are able to use, various computer applications. They continue to develop information-literacy skills and increasingly use technology to communicate with others in support of learning, while also recognizing the need for cyber safety and acceptable use policies. Students in grades 3-4 also investigate the impact of technology systems, understand the design process, and use it for problem solving.

In grades **5-8**, students expand their capacity to use operations and applications, apply information-literacy skills, and select the appropriate tools and resources to accomplish a variety of tasks, as they develop digital citizenship. As students participate in online learning communities, collaborating in the design of products that address local and global issues across the curriculum, they build understanding of the perspectives of learners from other countries. Students at this level can apply the design process in the development of products; understand impact constraints, trade-offs, and resource selection; and solve a design challenge and/or build a prototype using the design process. Students can explain why human-designed systems, products, and environments need to be monitored, maintained, and improved, and they recognize the interdependence of subsystems as parts of a system.

"New Jersey Department of Education." The Official Web Site for The State of New Jersey. July 7,2011: https://www13.state.nj.us/NJCCCS/ContentAreaTableView_Technology.aspx

# K – 8 TECHNOLOGY OBJECTIVES

1. The student will be able to operate a computer system and all its components according to grade level.

2. The student will demonstrate the proper use and care of all equipment.

3. The student will develop a working knowledge of Multi-media technology according to grade level.

4. The student will have the ability to access "online" information through the use of the computer.

5. The student will be able to use the computer as a research tool and as an outlet for creativity.

6. The student will develop good organizational skills and study habits, through the use of technology.

7. The student will enhance his/her problem solving skills through the use of the computer.

8. The student will know and use appropriate grade level keyboarding skills.

9. The student will demonstrate an awareness of the ethical use of all technologies in school, the workplace and society, as delineated in the district's acceptable use policy.

10. The student will use computer applications to modify information independently and/or collaboratively to solve problems.

11. The student will demonstrate an understanding of how changes in technology impact the workplace and society.

12. The student will exhibit communication skills in a global environment.

13. The student will be able to determine when technology tools are appropriate to solve a problem and make a decision.

# Preschool

# Technology Literacy Curriculum

# Pre-K Technology Curriculum

**8.1 Educational Technology:** All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaboratively and to create and communicate knowledge.

**8.2 Technology Education, Engineering, and Design:** All students will develop an understanding of the nature and impact of technology, engineering, technological design, and the designed world, as they relate to the individual, global society, and the environment.

| Objectives | NJCCCS |
|---|---|
| • Use the mouse to negotiate a simple menu on the screen (e.g., to print a picture) | 8.1.P.A.1 |
| • Use the computer to type their name and to create stories with pictures and letters/words | 8.1.P.A.2 |
| • Identify the "power keys" (e.g., ENTER, spacebar) on a keyboard. | 8.1.P.A.3 |
| • Recognize that the number keys are in a row on the top of the keyboard. | 8.1.P.A.4 |
| • Use basic technology terms in daily conversations | 8.1.P.A.5 |
| • Turn "laptop" computers on and off. | 8.1.P.A.6 |
| • Use "child friendly" digital camera" to take pictures for projects | 8.1.P.B.1 |
| • Use "laptop" computers frequently to recognize letters, letter blends, etc. | 8.1.P.C.1 |
| • Insert CDs/DVDs to listen to music (ABC Songs, Number Songs) | 8.1.P.C.2 |
| • Use Internet learning sites to enrich classroom learning and explore new concepts | 8.1.P.E.1 |

# Suggested Strategies and Resources for Pre-K Technology Curriculum

| **Suggested Strategies:** | **Suggested Resources:** |
|---|---|
| | Software: |
| Drawing and coloring pictures | KidPix (Drawing application)<br>Millie's Math House |
| Keyboard recognition | **Suggested Internet Resources:** |
| | **Mouse coordination Games:** |
| Mouse coordination | http://www.headsprout.com/code/launchMA.cfm<br>http://www.ferryhalim.com/orisinal/g3/starry.htm |
| Internet | http://www.david-lewis.com/sheepgame/launch.php |
| Letter and number recognition | **Letter and Number Recognition/Metacognition Skills**<br>www.nickjr.com<br>www.playhousedisney.com<br>www.iknowthat.com |
| | **Decision Making Skills**<br>http://bblocks.samhsa.gov/Children/Games/flash/weatherrace.aspx |
| | **Drawing**<br>www.kidscomjr.com |
| | **Keyboarding**<br>www.avenscorner.com |
| | **Suggested Smart Toys**<br>Leapfrog Learning toys<br>Vtech learning toys |

# Grades K - 2

# Technology Literacy Curriculum

# K-2 Technology Curriculum

| **8.1 Educational Technology:** All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaboratively and to create and communicate knowledge. | |
|---|---|
| **Objectives** | **NJCCCS** |
| • Identify the basic features of a computer and explain how to use them effectively. | 8.1.2.A.1 |
| • Use technology terms in daily practice. | 8.1.2.A.2 |
| • Discuss the common uses of computer applications and hardware and identify their advantages and disadvantages. | 8.1.2.A.4 |
| • Create a document with text using a word processing program. | 8.1.2.A.4 |
| • Demonstrate the ability to navigate in virtual environments that are developmentally appropriate. | 8.1.2.A.5 |
| • Illustrate and communicate original ideas and stories using digital tools and media-rich resources. | 8.1.2.B.1 |
| • Engage in a variety of developmentally appropriate learning activities with students in other classes, schools, or countries using electronic tools. | 8.1.2.C.1 |
| • Model legal and ethical behaviors when using both print and non-print information by citing resources. | 8.1.2.D.1 |
| • Use digital tools and online resources to explore a problem or issue affecting children, and discuss possible solutions. | 8.1.2.E.1 |
| • Use mapping tools to plan and choose alternate routes to and from various locations. | 8.1.2.F.1 |

| **8.2 Technology Education, Engineering, and Design:** All students will develop an understanding of the nature and impact of technology, engineering, technological design, and the designed world, as they relate to the individual, global society, and the environment. | |
|---|---|
| **Objectives** | **NJCCCS** |
| • Describe how technology products, systems, and resources are useful at school, home, and work. | 8.2.2.A.1 |
| • Brainstorm and devise a plan to repair a broken toy or tool using the design process. | 8.2.2.B.1 |
| • Investigate the influence of a specific technology on the individual, family, community, and environment. | 8.2.2.B.2 |
| • Demonstrate how reusing a product affects the local and global environment. | 8.2.2.C.1 |
| • Collect and post the results of a digital classroom survey about a problem or issue and use data to suggest solutions. | 8.2.2.D.1 |
| • Communicate with students in the United States or other countries using digital tools to gather information about a specific topic and share results. | 8.2.2.E.1 |
| • Identify the resources needed to create technological products and systems. | 8.2.2.F.1 |
| • Describe how the parts of a common toy or tool interact and work as part of a system. | 8.2.2.G.1 |
| • Explain the importance of safety in the use and selection of appropriate tools and resources for a specific purpose. | 8.2.2.G.2 |

## Strategies and Resources for Grades K-2 Technology Curriculum

## Suggested Strategies:

**Digital Tools:**
Computer
Digital camera
Software
Online community
Video Conferencing

**Documents:**
Letter
Newsletter
Brochure
Booklet
Email
Drawings
Graphs

**Multimedia Presentations:**
Slide Shows
Movies
Podcasts

**Discussions:**
Vocabulary
Parts of the Computer
Online Activities

## Suggested Resources:

**Word Processing:**

Microsoft Office
Word
Google Documents
Microsoft Publisher

**Keyboarding:**

Type to Learn
Type to Learn Jr.
Online keyboarding games

**Multimedia:**

Microsoft PowerPoint
SlideShare
Animoto
Glogster

**Podcasting:**

Audacity
Microsoft PowerPoint

**Online Collaboration:**

ePals
Google Docs

**Digital Citizenship:**

Cybersmart
Cyberethics for Kids
Digizen
Isafe.com
Netsmartz
WebWiseKids
WiredSafety

**Simple Machines:**

EdHead
Dirt Meister: Simple Machines

**Internet Browsers:**

Internet Explorer
Firefox
Safari

**Copyright Free Images& Sounds:**

Pics4Learning
NOAA Photo Library
FreeFoto
The Morgue File
Picsearch

**Drawing Tools:**

KidPix
SketchUp

**Mapping Tools:**

Google Maps
Mapquest
Google Earth

# Grades 3 - 4

# Technology Literacy Curriculum

# Grades 3-4 Technology Curriculum

| **8.1 Educational Technology:** All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaboratively and to create and communicate knowledge. | |
|---|---|
| **Objectives** | **NJCCCS** |
| • Demonstrate effective input of text and data using an input device. | 8.1.4.A.1 |
| • Create a document with text formatting and graphics using a word processing program. | 8.1.4.A.2 |
| • Create and present a multimedia presentation that includes graphics. | 8.1.4.A.3 |
| • Create a simple spreadsheet, enter data, and interpret the information. | 8.1.4.A.4 |
| • Determine the benefits of a wide range of digital tools by using them to solve problems. | 8.1.4.A.5 |
| • Produce a media-rich digital story about a significant local event or issue based on first-person interviews. | 8.1.4.B.1 |
| • Engage in online discussions with learners in the United States or from other countries to understand their perspectives on a global problem or issue. | 8.1.4.C.1 |
| • Explain the need for each individual, as a member of the global community, to practice cyber safety, cyber security, and cyber ethics when using existing and emerging technologies. | 8.1.4.D.1 |
| • Analyze the need for and use of copyrights. | 8.1.4.D.2 |
| • Explain the purpose of an acceptable use policy and the consequences of inappropriate use of technology. | 8.1.4.D.3 |
| • Investigate a problem or issue found in the United States and/or another country from multiple perspectives, evaluate findings, and present possible solutions, using digital tools and online resources for all steps. | 8.1.4.E.1 |
| • Evaluate the accuracy of, relevance to, and appropriateness of using print and non-print electronic information sources to complete a variety of tasks. | 8.1.4.E.2 |
| • Select and apply digital tools to collect, organize, and analyze data that support a scientific finding. | 8.1.4.F.1 |

| **8.2 Technology Education, Engineering, and Design:** All students will develop an understanding of the nature and impact of technology, engineering, technological design, and the designed world, as they relate to the individual, global society, and the environment. | |
|---|---|
| **Objectives** | **NJCCCS** |
| • Investigate factors that influence the development and function of technology products and systems. | 8.2.4.A.1 |
| • Using a digital format, compare and contrast how a technology product has changed over time due to economic, political, and/or cultural influences. | 8.2.4.A.2 |
| • Develop a product using an online simulation that explores the design process. | 8.2.4.B.1 |
| • Design an alternative use for an existing product. | 8.2.4.B.2 |
| • Explain the positive and negative effect of products and systems on humans, other species, and the environment. | 8.2.4.B.3 |
| • Compare and contrast how technology transfer happens within a technology, among technologies, and among other fields of study. | 8.2.4.B.4 |
| • Explain the impact of disposing of materials in a responsible way. | 8.2.4.C.1 |
| • Explain the purpose of trademarks and the impact of trademark infringement on businesses. | 8.2.4.C.2 |
| • Examine ethical considerations in the development and production of a product from its inception through production, marketing, use, maintenance, and eventual disposal by consumers. | 8.2.4.C.3 |
| • Analyze responses collected from owners/users of a particular product and suggest modifications in the design of the product based on their responses. | 8.2.4.D.1 |
| • Work in collaboration with peers to produce and publish a report that explains how technology is or was successfully or unsuccessfully used to address a local or global problem. | 8.2.4.E.1 |
| • Describe how resources are used in a technological product or system. | 8.2.4.F.1 |
| • Explain how resources are processed in order to produce technological products and systems. | 8.2.4.F.2 |
| • Examine a malfunctioning tool and use a step-by-step process to troubleshoot and present options to repair the product. | 8.2.4.G.1 |
| • Explain the functions of a system and subsystems. | 8.2.4.G.2 |
| • Evaluate the function, value, and aesthetics of a technological product, system, or environment from the perspective of the user and the producer. | 8.2.4.G.3 |

# Strategies and Resources

# for Grades 3 & 4 Technology Curriculum

## Suggested Strategies:

**Digital Tools:**
Computer
Digital camera
Software
Online community
Video Conferencing

**Documents:**
Letter
Newsletter
Brochure
Booklet
Email
Drawings
Graphs
Spreadsheets

**Multimedia Presentations:**
Slide Shows
Movies
Podcasts

**Discussions:**
Vocabulary
Parts of the Computer
Online Activities
Copyright/Trademarks
Design Process

## Suggested Resources:

**Word Processing:**
Microsoft Office Word
Google Documents
Microsoft Publisher

**Keyboarding:**
Type to Learn
UltraKey
Online keyboarding games

**Podcasting:**
Audacity
Microsoft PowerPoint

**Online Collaboration:**
ePals
Google Docs

**Internet Sites:**
EdHead
Dirt Meister: Simple Machines
Design a House with Frank Lloyd Wright

**Internet Browsers:**
Internet Explorer
Firefox
Safari

**Video Conferencing:**

Skype
Oovo
Google Talk

**Spreadsheets:**

Microsoft Excel
Google Docs

**Mapping Tools:**

Google Maps
Mapquest
Google Earth

**Multimedia:**

Microsoft PowerPoint
SlideShare
Animoto
Glogster

**Drawing Tools:**

KidPix
SketchUp

**Copyright Free Images& Sounds**

Picsearch
Pics4Learning
FreeFoto
The Morgue File

**Digital Citizenship:**

Cybersmart
Cyberethics for Kids
Digizen
Isafe.com
Netsmartz
WebWiseKids
WiredSafety

# Grades 5 – 8

# Technology Literacy Curriculum

## Grades 5 – 8 Technology Curriculum

| **8.1 Educational Technology:** All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaboratively and to create and communicate knowledge. | |
|---|---|
| **Objectives** | **NJCCCS** |
| • Create professional documents using advanced features of a word processing program. | 8.1.8.A.1 |
| • Plan and create a simple database, define fields, input data, and produce a report using sort and query. | 8.1.8.A.2 |
| • Create a multimedia presentation including sound and images. | 8.1.8.A.3 |
| • Generate a spreadsheet to calculate, graph, and present information. | 8.1.8.A.4 |
| • Select and use appropriate tools and digital resources to accomplish a variety of tasks and to solve problems. | 8.1.8.A.5 |
| • Synthesize and publish information about a local or global issue or event on a collaborative, web-based service. | 8.1.8.B.1 |
| • Participate in an online learning community with learners from other countries to understand their perspectives on a global problem or issue, and propose possible solutions. | 8.1.8.C.1 |
| • Model appropriate online behaviors related to cyber safety, cyber bullying, cyber security, and cyber ethics. | 8.1.8.D.1 |
| • Summarize the application of fair use and Creative Commons guidelines. | 8.1.8.D.2 |
| • Demonstrate how information on a controversial issue may be biased. | 8.1.8.D.3 |
| • Gather and analyze findings using data collection technology to produce a possible solution for a content-related or real-world problem. | 8.1.8.E.1 |
| • Use an electronic authoring tool in collaboration with learners from other countries to evaluate and summarize the perspectives of other cultures about a current event or contemporary figure. | 8.1.8.F.1 |

# Strategies and Resources
# for Grades 5 – 8 Technology Curriculum

## Suggested Strategies:

**Digital Tool:**
Computer
Digital camera
Software
Cell phone
GPS
Online community
Virtual conference

**Professional Document:**
Friendly Letter
Business Letter
Newsletter
Brochure
Booklet
Flyer
Advertisement

**Spreadsheet and Database:**
Average (stock market, grades, cost of items, temperatures)
Sort and query (vocabulary words, states, capitals, playlist)
Sum (shopping spree, party planner, trips)
Report
Graph (surveys)

**Multimedia Presentation:**
Slide Show
Movie (heritage, public service announcement news broadcast)
Podcast (commercial, poetry reading, book talk, interview)
Vlog

**Web-based Service/Shared Hosted Service:**
Podcast
Video
Vlog

**Online Learning Community / Authoring Tool:**
Ning
Blog
Wiki

## Suggested Resources:

**Word Processing:**
Microsoft Office Word
Google Documents
Microsoft Publisher

**Keyboarding:**
UltraKey
Type to Learn
Online keyboarding games

**Blogs and Authoring Tools:**

Blogger
Blogspot
EduBlog
Epals
Pbwiki
Skype
Wikispaces
Wordpress
Blogmeister

**Spreadsheet/Database:**

Microsoft Excel
Google Doc Spreadsheet
Scorecard.goodguide
TwinCities Data Planet
World Resources Institute: EarthTrends

**Wikis/Nings:**

PB Wiki
Wikispaces
WetPaint
Nings

**Multimedia:**

Microsoft Powerpoint
Quicktime
Glogster
SlideShare
Windows Movie Maker
VoiceThread
Animoto
Blabberize

**Video Conferencing:**

Skype
Oovoo

**Copyright Free Images & Sounds:**

Pics4Learning
NOAA Photo Library
FreeFoto
The Morgue File
US Federal Government
Public Domain Images
CreativeCommons.org
Teacher Tap
Gimp Savvy

**Video Hosting:**

Slideshare.net
Schooltube
TeacherTube
YouTube

**Digital Citizenship:**

Cybersmart
Cyberethics for Kids
Digizen
Isafe.com
Netsmartz
WebWiseKids
WiredSafety

**Podcasting:**

Audacity
Garage Band

**Other Apps:**

Google maps
Survey Monkey
MyWebspiration
Google Sites
Google Docs
Google Forms (survey)

# Grades 5 – 8 Technology Curriculum

| **8.2 Technology Education, Engineering, and Design:** All students will develop an understanding of the nature and impact of technology, engineering, technological design, and the designed world, as they relate to the individual, global society, and the environment. | |
|---|---|
| **Objectives** | **NJCCCS** |
| • Explain the impact of globalization on the development of a technological system over time. | 8.2.8.A.1 |
| • Design and create a product that addresses a real-world problem using the design process and working with specific criteria and constraints. | 8.2.8.B.1 |
| • Identify the design constraints and trade-offs involved in designing a prototype by completing a design problem and reporting results in a multimedia presentation. | 8.2.8.B.2 |
| • Solve a science-based design challenge and build a prototype using science and math principles throughout the design process. | 8.2.8.B.3 |
| • Explain the need for patents and the process of registering one. | 8.2.8.C.1 |
| • Compare and contrast current and past incidences of ethical and unethical use of labor in the United States or another country and present results in a media-rich presentation. | 8.2.8.C.2 |
| • Evaluate the role of ethics and bias on trend analysis and prediction in the development of a product that impacts communities in the United States and/or other countries. | 8.2.8.D.1 |
| • Work in collaboration with peers and experts in the field to develop a product using the design process, data analysis, and trends, and maintain a digital log with annotated sketches to record the development cycle. | 8.2.8.E.1 |
| • Explain the impact of resource selection and processing in the development of a common technological product or system. | 8.2.8.F.1 |
| • Explain how the resources and processes used in the production of a current technological product can be modified to have a more positive impact on the environment. | 8.2.8.F.2 |
| • Explain why human-designed systems, products, and environments need to be constantly monitored, maintained, and improved. | 8.2.8.G.1 |
| • Explain the interdependence of a subsystem that operates as part of a system. | 8.2.8.G.2 |

# Strategies and Resources
# for Grades 5 – 8 Technology Curriculum

## Suggested Strategies:

**Impact of Globalization:**
Global warming
Habitats
Water systems
Natural disasters
Oil spills
Pollution
Weather

**Product Design and Creation:**
Bridges
Dams
Domes
Inventions
Machines
Sky scrapers
Tunnels

## Suggested Resources:

**Global Collaborative Projects:**

Thinkquest:
http://www.thinkquest.org/en/
Epals:
http://www.epal.com/
Flat Classrooms:
http://flatclassrooms.ning.com/
Global SchoolNet:
http://www.globalschoolnet.org/gsh/pr/
Global Collaboration:
http://globalcollaborations.wikispaces.com/
The Global Education Collaborative:
http://globaleducation.ning.com/

**Copyright:**

U.S. Copyright Office:
http://www.copyright.gov/
Cyber Ethics for Kids:
http://www.cybercrime.gov/rules/kidinternet.htm
Copyright Kids:
http://www.copyrightkids.org/
MIT'S Inventor's Handbook
http://web.mit.edu/afs/athena.mit.edu/org/i/invent/h-main.html

**Product Design and Creation:**

Discovery Education:
http://www.discoveryeducation.com/search/page/6-8/-/lesson-plan/technology/index.cfm
Bridges:
http://www.pbs.org/wgbh/buildingbig/bridge/index.html
http://www.discoveryeducation.com/teachers/free-lesson-plans/bridges.cfm
Domes:
http://www.pbs.org/wgbh/buildingbig/dome/index.html

Dams:
http://www.pbs.org/wgbh/buildingbig/dam/index.html
Inventions:
http://www.mos.org/sln/Leonardo/InventorsWorkshop.html
http://www.iteea.org/i3/files/Unit%20Descriptions.pdf
http://www.discoveryeducation.com/teachers/free-lesson-plans/inventors-workshop.cfm
Machines:
http://www.infocrumb.iwarp.com/machine.htm
http://www.mikids.com/Smachines.htm
http://www.fi.edu/pieces/knox/automaton/simple.htm
http://edtech.kennesaw.edu/web/simmach.html
Skyscrapers
http://www.pbs.org/wgbh/buildingbig/skyscraper/index.html
Tunnels
http://www.pbs.org/wgbh/buildingbig/tunnel/index.html