

Middle School Computer Curriculum

ISTE Standard	Resources	Grade Expectations	Examples
1. Empowered Learner	Examples of digital tools may include:	By the end of Grade 8 each student will:	Examples of possible activities:
Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences. Students:	online productivity software, graphics programs/websites, online coding websites Google Apps Create and share your work online using word processing,	 describe strategies for solving routine hardware and software problems use advanced word processing features (i.e. tables, columns, 	Integrate a variety of file types to create and illustrate a document or presentation. Complete online computer
 a. articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process itself to improve learning outcomes. b. build networks and 	presentations, spreadsheets, forms and drawings. Edit anytime, from anywhere. Pick who can access your documents. Share changes in real time. Files are stored securely online. Google Apps Learning Center The Apps Show, Presented	graphics) create media-rich presentations by ethically using appropriate digital tools, software, apps and resources understand and use concepts of effective multimedia design use a variety of technology tools (e.g.	science course that teaches coding.
customize their learning environments in ways that support the learning	by Google How Stuff Works	spellchecker, thesaurus, dictionary, calculator) to maximize the accuracy of	

process

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- c. use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways.
- d. understand the fundamental concepts of technology operations, demonstrate the ability to choose, use and troubleshoot current technologies and are able to transfer their knowledge to explore emerging technologies.

Wondering what's inside your computer or how the latest computer technologies work? Browse their articles below on computer networking, security, hardware, software and more to get explanations and how-to tips.

Teacher-created flipped videos using Screencast-o-matic.com
A free web-based screen recorder designed to capture your screen activity, audio and webcam images in real-time then save, publish and share your video.

PixIr Express and PixIr Editor
Free online image editors.
Enables to fix, adjust, and
filter images in a browser.
PixIr Editor is a robust
browser photo editor that
includes layers and effects.

Code.org Learn the basic concepts of Computer Science with drag and drop programming. This is a game-like, self-directed tutorial starring video lectures by Bill Gates, Mark Zuckerberg, Angry Birds and Plants vs. Zombies. Learn

- technology-produced materials
- know how to create spreadsheets and use various functions available in a database (e.g., filtering, sorting, charts)
- Identify spreadsheet terms/concepts and use spreadsheet program to enter, calculate, display data and choose correct graph format for result
- use basic features of graphics program to edit images, including resizing, cropping, enhancing and saving correctly
- demonstrate file management skills
- identify a variety of information storage devices (e.g., cloud-based, CDs, DVDs, flash drives, SD cards) and provide rationales for using a certain device for a specific purpose
- Use web-based coding software to learn basic programming concepts:
 - Sequencing
 - Loops

repeat-loops, conditionals, and basic algorithms.

Scratch With Scratch, you can program your own interactive stories, games, and animations — and share your creations with others in the online community. Scratch helps young people learn to think creatively, reason systematically, and work collaboratively — essential skills for life in the 21st century.

Khan Academy-On Khan Academy, we offer a multi-hour, self-paced curriculum in JavaScript and lessons in HTML / CSS as well as SQL (language for databases) for students to learn various forms of programming. For Hour of Code, we've created special introductory curricula to get your students started!

Alice- Using an innovative programming environment to support the creation of 3D animations, the Alice Project provides tools and materials for teaching and learning computational thinking, problem solving, and

- Conditionals
- Functionals
- Functionals with parameters
- Variables
- Use web-based coding software to demonstrate computational thinking:
 - Decomposition
 - Patterns
 - Abstraction
 - o Algorithms
- use accurate technology terminology
- use technology to identify and explore various occupations or careers especially those related to science, technology, engineering, and mathematics
- discuss possible uses of technology to support personal pursuits and lifelong learning
- understand and discuss how assistive

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	computer programming across a spectrum of ages and grade levels.	technologies can benefit all individuals discuss security issues related to e-commerce.	
2. Digital Citizen	Examples of digital citizenship tools include:	By the end of Grade 8 each student will:	Examples of possible activities:
Students recognize the rights, responsibilities and opportunities of living, learning and working in an interconnected digital world, and they act and model in ways that are safe, legal and ethical. Students: a. cultivate and manage	online reference tools, digital literacy/citizenship websites, EasyBib Bibliography Creator (Google Doc Add-On) A fully automatic bibliography maker that auto-fills. It's the easiest way to build a works cited page	 provide accurate citations when referencing information sources, discuss issues related to acceptable and responsible use of technology (e.g. privacy, security, copyright, plagiarism, viruses, 	Discuss implications of domain names and investigate sources for potential bias (e.g., .gov, .net, .com, .edu). Explain how copyright law protects an author's original work.
their digital identity and reputation and are aware of the permanence of their actions in the digital world.	Copyright and Fair Use Guidlines for Students Copyright Information Includes up to date copyright information as well as a	file-sharing) discuss the consequences related to unethical use of information and communication technologies	Use digital bibliography tools to site and organize sources for research projects. Cite all sources properly.
 b. engage in positive, safe, legal and ethical behavior when using technology, including social interactions online or when using networked devices. 	variety of other web tools . Common Sense Education age-appropriate lessons that address digital literacy and citizenship topics NetSmartz Workshops	 discuss possible societal impact of technology in the future and reflect on the importance of technology in the past create media-rich presentations on the appropriate and ethical 	Understand passwords, privacy and anonymity Identify the impact of unethical use of technology (e.g., hacking, plagiarism, pirating)
 c. demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual 	Through teaching lessons about Internet safety, the YAB members have those concepts reinforced in their own lives. It is just more one	use of digital tools and resources • discuss the long term ramifications (digital footprint) of participating	Explain the legal consequences of breaking acceptable use policies.

property. step that our community is in questionable online Organize and manage files taking towards helping every and folders between activities (e.g., posting child stay safer online. d. manage their personal photos of risqué poses or school, home and online data to maintain digital underage drinking, making threats to others) privacy and security and describe the potential are aware of risks and dangers data-collection technology used to track associated with online their navigation online. communications. Examples of digital tools may By the end of grade 8 each Examples of possible 3. Knowledge include: student will: activities: Constructor online library catalog, visualization/concept tools, use a variety of digital Locate information using Students critically curate a shared documents.websites. the online library catalog, resources to locate variety of resources using online survey information, internet, and electronic digital tools to construct evaluate information from databases. knowledge, produce creative **Destiny Library Search** online information artifacts and make meaningful resources for accuracy Utilize a search engine's learning experiences for EasyBib Bibliography Creator and bias, understand that advanced search options to themselves and others. (Google Doc Add-On) using information from a locate text, images, audio, Students: A fully automatic bibliography single Internet source and video resources and maker that auto-fills. It's the bookmark their results. might result in the a. plan and employ easiest way to build a works reporting of erroneous effective research Use online resources. facts and that multiple cited page. strategies to locate including databases, to sources should always information and other be researched search for information Create-A-Graph resources for their NCES constantly uses graphs identify types of web relevant to their topic and intellectual or creative and charts in our publications sites based on their create a bibliography. pursuits. and on the web. Sometimes, domain names (e.g., complicated information is edu, com, org, gov, net) b. evaluate the accuracy, difficult to understand and employ data-collection perspective, credibility needs an illustration. Graphs technologies (e.g., and relevance of or charts can help impress probes, handheld information, media, data people by getting your point devices, GPS units, or other resources.

geographic mapping systems) to gather, view,

across quickly and visually.

c. curate information from

digital resources using a
variety of tools and
methods to create
collections of artifacts
that demonstrate
meaningful connections
or conclusions.

 build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

Timeline

Timeline allows students to create a graphical representation of an event or process by displaying items sequentially along a line. Timelines can be organized by time of day, date, or event, and the tool allows users to create a label with short or long descriptive text. Adding an image for each label makes a timeline more visually appealing.

and analyze the results for a content-related problem.

4. Innovative Designer

Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions. Students:

- a. Know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
- Select and use digital tools to plan and manage a design process that considers

Examples of digital tools may include: interactive whiteboards, drawing/painting websites/programs, Google Apps, visualization/concept maps, databases, multimedia slide shows, digital storytelling, blogs, wikis

Audacity

Audacity is free, open source software for recording and editing sounds.

Blabberize

Using a picture and microphone, build quick and easy animated activities and watch your pictures come to life.

By the end of Grade 8 each student will:

- create an original project (e.g., presentation, web page, newsletter, information brochure,poster, video) using a variety of media (e.g., animations, graphs, charts, audio, graphics, video) to present content information to an audience,
- apply common software features (e.g., spellchecker, thesaurus, formulas, charts, graphics, sounds) to enhance communication

Examples of possible activities:

Create a web page, digital video or podcast..

Enhance web pages, blogs and wikis by adding graphics, sound, music and videos.

Create and save an audio file using an audio editing program, then export that file in and accepted format so they can import the file into a multimedia presentation.

- design constraints and calculated risks.
- Develop, test and refine prototypes as part of a cyclical design process.
- d. Exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.

<u>WeVideo</u>-cloud-based collaborative video creation platform.

Wordle

Wordle is a toy for generating "word clouds" from text that you provide. The clouds give greater prominence to words that appear more frequently in the source text.

Tagxedo-

Tagxedo turns words - famous speeches, news articles, slogans and themes, even your love letters - into a visually stunning word cloud.

- with an audience and to support creativity
- illustrate a content-related concept using a model, simulation, or concept mapping software.

Create an interactive presentation on a topic to share with an audience.

Create a PSA video on a topic of study, post it online, then get feedback from experts preselected by the teacher, i.e. a marketing professional, a health and safety official, etc..

Post book reviews on local bookstore website for the community to read, review, and comment upon.

On a wiki, contribute to a group project about a current event and its impact on society/environment/etc.

Participate in an online activity with a class in another state to examine how weather impacts their lives.

Demonstrate
understanding of
government by making
predictions about the
upcoming political or
legislative vote and use
digital tools to find and

5. Computational Thinker

Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions. Students:

- a. formulate problem
 definitions suited for
 technology-assisted
 methods such as data
 analysis, abstract
 models and algorithmic
 thinking in exploring and
 finding solutions.
- collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.
- c. break problems into component parts, extract key information,

Examples of digital tools may include: online survey tools, collaboration tools such as Google Apps interactive online resources/databases, online news publications

Google Forms

Create online forms and surveys, analyze data in Sheets

Tween Tribune
Daily new site for kids

Google Earth

Google Earth lets you fly anywhere on Earth to view satellite imagery, maps, terrain, 3D buildings, from galaxies in outer space to the canyons of the ocean. You can explore rich geographical content, save your toured places, and share with others.

Gizmos

ExploreLearning currently has over 450 Gizmos with accompanying curricular materials, all with the aim of By the end of grade 8 each student will:

- use databases or spreadsheets to make predictions, develop strategies, and evaluate decisions to assist with solving a problem
- evaluate available digital resources and select the most appropriate application to accomplish a specific task (e, g., word processor, table, outline, spreadsheet, presentation program, app)
- gather data, examine patterns, and apply information for decision making using available digital resources

Conduct a school-wide online poll to gain input about a school issue.

clouds of speeches, surveys, historical data)

represent trends that justify their predictions (i.e. word

Use online survey and spreadsheet tools to collaborate with community groups to compile data about a current issue and share the results back to the community.

Import real time data from online sources and examine its meaning or implication using spreadsheet software.

and develop descriptive models to understand complex systems or facilitate problem-solving.	sharing the "Ah-Hah!" moment with teachers and students.		
automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.			
6. Creative Communicator	Examples of digital tools may include:	By the end of Grade 8 each student will:	Examples of possible activities:
Students communicate and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals. Students:	Google Docs, wikis, blogs, online forums, web-based collaborative work spaces, drawing/painting software/website, video/audio conferencing Google Apps Create and share your work	 use digital resources (e.g., discussion groups, blogs, podcasts, videoconferences, Moodle, Google Classroom) to collaborate with peers, experts, and other 	Investigate and illustrate complex ideas or processes using collaborative concept mapping software. Create blogs, wikis or other collaborative forums to
a. Choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.	online using word processing, presentations, spreadsheets, forms and drawings. Edit anytime, from anywhere. Pick who can access your documents. Share changes in real time. Files are stored	 audiences use collaborative digital tools to explore common curriculum content with learners from other cultures identify effective uses of 	share ideas. Create and share a group digital project (e.g., newspaper, flyer, movie or slide presentation).
b. Create original works or responsibly repurpose or remix digital resources into new creations.	securely online. Padlet - Padlet is a virtual wall that allows people to express their thoughts on a common	technology to support communication with peers, family, or school personnel.	Create and publish digital writing to a blog for peer review. Use interactive online tools

- c. Communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualization, models or simulations.
- d. Publish or present content that customizes the message and medium for their intended audiences.

topic easily. It works like an online sheet of paper where people can put any content (e.g. images, videos, documents, text) anywhere on the page, together with anyone, from any device.

Kidblog – Student blog-publishing website that gives students' writing a meaningful purpose and an authentic audience. Teachers moderate all content. Students are engaged in the process of pre-writing, drafting, revising, editing, publishing, and commenting

Audacity

Audacity is free, open source software for recording and editing sounds.

Edmodo

A private social platform for teachers and students to share ideas, files, events and assignments.

Weebly

A drag and drop website and blog creation tool

Mindmeister

Simultaneously work on mind maps with friends and

to comment, link, post and embed information (e.g., wikis, blogs).

Comment on a writing project using online tools (e.g., a blog).

Debate a topic using online tools (e.g., blogs, wikis).

Participate in the Mystery Skype game with a classroom in an unknown location.

	colleagues and see changes as they happen. Voki Voki is a free service that allows you to create personalized speaking avatars and use them on your blog, profile, and in email messages. Mystery Skype Mystery Skype is an educational game, invented by teachers, played by two classrooms on Skype. The aim of the game is to guess the location of the other classroom by asking each other questions. It's suitable for all age groups and can be used to teach subjects like geography, history, languages, mathematics and science.		
7. Global Collaborator Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally. Students: a. use digital tools to connect with learners	Examples of digital tools may include: Google Docs, Google Earth, Google MyMaps, Google Sheets, Google Forms, wikis, blogs, online forums, web-based collaborative work spaces, video/audio conferencing	By the end of Grade 8 each student will: • use digital resources (e.g., discussion groups, blogs, podcasts, videoconferences, Moodle, Google Classroom) to collaborate with peers,	Examples of possible activities: Solving real-world community problems, ie. design tools to help community members cope during heavy winter storms.

- from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning.
- b. use collaborative technologies to work with others, including peers, experts or community members, to examine issues and problems from multiple viewpoints.
- c. contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.
- d. explore local and global issues and use collaborative technologies to work with others to investigate solutions.

Google Apps

Create and share your work online using word processing, presentations, spreadsheets, forms and drawings. Edit anytime, from anywhere. Pick who can access your documents. Share changes in real time. Files are stored securely online.

Google Forms

Create online forms and surveys, analyze data in Sheets

Google Earth

Google Earth lets you fly anywhere on Earth to view satellite imagery, maps, terrain, 3D buildings, from galaxies in outer space to the canyons of the ocean. You can explore rich geographical content, save your toured places, and share with others.

- experts, and other audiences both locally and globally
- use collaborative digital tools to explore common curriculum content with learners from other cultures both locally and globally
- identify effective uses of technology to support communication with peers, family, school personnel and other members of the global community.

Analyze and compare immigration patterns of families

Embedded Technology in Common Core State Standards-Grades 6,7,8

	6	7	8
Reading- Informational Text: Integration of Knowledge and Ideas	CCSS.ELA-LITERACY.RI.6.7 Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.		CCSS.ELA-LITERACY.RI.8.7 Evaluate the advantages and disadvantages of using different mediums (e.g., print or digital text, video, multimedia) to present a particular topic or idea.
		CCSS.ELA-LITERACY.C CRA.R.7 Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.	
Writing- Production and Distribution of Writing	CCSS.ELA-LITERACY.CCR A.W.6 Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.		
	CCSS.ELA-LITERACY.W.6.6	CCSS.ELA-LITERACY.W	CCSS.ELA-LITERACY.W.8.6 Use

	Use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of three pages in a single sitting.	.7.6 Use technology, including the Internet, to produce and publish writing and link to and cite sources as well as to interact and collaborate with others, including linking to and citing sources.	technology, including the Internet, to produce and publish writing and present the relationships between information and ideas efficiently as well as to interact and collaborate with others.
Writing- Research to Build and Present Knowledge		CCSS.ELA-LITERACY.C CRA.W.7 Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.	CCSS.ELA-LITERACY.CCRA.W.8 Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.
	CCSS.ELA-LITERACY.W.6.8 Gather relevant information from multiple print and digital sources; assess the credibility of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and providing basic bibliographic	CCSS.ELA-LITERACY.W .7.8 Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of	CCSS.ELA-LITERACY.W.8.8 Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.

Writing-Text Types and Purposes	ccss.ela-literacy.w.6 .2.A Introduce a topic; organize ideas, concepts, and information, using strategies such as definition, classification, comparison/contrast, and cause/effect; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding	others while avoiding plagiarism and following a standard format for citation. CCSS.ELA-LITERACY.W .7.2.A Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information, using strategies such as definition, classification, comparison/contras t, and cause/effect; include formatting (e.g., headings),graphics (e.g., charts, tables), and multimedia when useful to aiding	CCSS.ELA-LITERACY.W.8.2.A Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.
Speaking and Listening- Presentation of Knowledge and Ideas	comprehension. CCSS.ELA-LITERACY.SL.6. 5 Include multimedia components (e.g., graphics, images, music, sound) and visual displays in presentations to clarify information.	comprehension. CCSS.ELA-LITERACY.S L.7.5 Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.	CCSS.ELA-LITERACY.SL.8.5 Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest.
Language- Vocabulary	CCSS.ELA-LITERACY.L.6.4.	CCSS.ELA-LITERACY.L.	CCSS.ELA-LITERACY.L.8.4.C

Acquisition and Use	C Consult reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning or its part of speech.	7.4.C Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning or its part of speech.	Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning or its part of speech.
Science & Technical Subjects- Integration of Knowledge and Ideas	CCSS.ELA-LITERACY.RST.6-8.7 Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table). CCSS.ELA-LITERACY.RST.6-8.9 Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.		
Writing in History/Social Studies, Science, and Technical Subjects	CCSS.ELA-LITERACY.WHST.6-8.2.A Introduce a topic clearly, previewing what is to follow;		
	CCSS.ELA-LITERACY.WHST.6-8.6 Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.		
	each source; and quote	arch terms effectively; asse	ss the credibility and accuracy of conclusions of others while