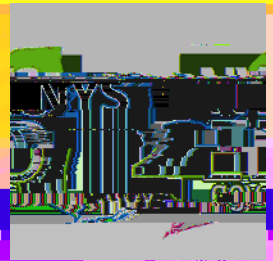


# K-12 Computer Science and Digital Fluency Learning Standards




## Grades K-12 Standards Examples

New York State  
Education  
Department

# Contents

## Impacts of Computing



<b>Society</b>	<b>1</b>
<b>Ethics</b>	<b>3</b>
<b>Accessibility</b>	<b>6</b>
<b>Career Paths</b>	<b>7</b>

## Computation



<b>Modeling and Simulation</b>	<b>8</b>
<b>Data Analysis and Visualization</b>	<b>9</b>
<b>Abstraction and Decomposition</b>	<b>11</b>
<b>Algorithms and Programming</b>	<b>12</b>

## Networks & System Design



<b>Hardware and Software</b>	<b>17</b>
<b>Networks and the Internet</b>	<b>19</b>

## Cybersecurity



<b>Risks</b>	<b>21</b>
<b>Safeguards</b>	<b>2</b>
<b>Response</b>	<b>2</b>

## Digital Literacy



<b>Digital Use</b>	<b>24</b>
<b>Digital Citizenship</b>	<b>2</b>



## Society

Standard Identifier	Examples
K-1.IC.1	<p><b>Example 1:</b> Students could discuss the differences between playing a board game and a video game or mailing a letter and getting a text message.</p> <p><b>Example 2:</b> Students could create a T chart of things they do that use technology and then compare that to how those tasks were accomplished before technology. Tasks might include looking things up online, map application, online games.</p> <p><b>Example 3:</b></p>

Standard Identifier	Examples
7-8.IC.1	<p><b>Example 1:</b> Students could identify trade-offs with a new and emerging technology, discussing how the technology could improve convenience, but also impact personal privacy.</p> <p><b>Example 2:</b> Students could research how technology such as the Siri and Alexa have changed the way to interact.</p> <p><b>Example 3:</b> Have students research history of computers. What factors made computer more commonplace, what effects did that have on society/jobs?</p> <p><b>Example 4:</b> Have student’s snail mail a letter to themselves. Then send an email. Discuss the differences and impacts this has had on society.</p>
9-12.IC.1	<p><b>Example 1:</b> Students could research how better access to information and/or resources affects a population and devel.7(p)l2a0 10.02 15fopr mli7(an)-3.7( re f* 569/</p>





7-8.IC.4

## Accessibility

Standard Identifier	Examples
K-1.IC.6	<p><b>Example 1:</b> Students could use both a mouse and a touch screen to operate a computer.</p> <p><b>Example 2:</b> Voice recognition software and other assistive devices and capabilities can be explored.</p>
2-3.IC.6	<p><b>Example 1:</b> Students might compare a travel keyboard with a standard keyboard and note that one is easier to carry around but difficult to type with, while the other might be easier to type with but difficult pack into a bag.</p> <p><b>Example 2:</b> Voice recognition software could be explored to see examples of what makes it work well or not as well.</p> <p><b>Example 3:</b> Compare a laptop/chrome book/tablet to a desktop computer in a chart with the class. Discuss whb/P &lt;&lt;/MCID 42-0.02 140 0 10.02 155-1.8os c(c(&gt;BDC</p>









Standard Identifier	Examples
7-8.CT.2	<p><b>Example 1:</b> Students could collect temperature data with a sensor and distribute a digital form to community members for a community planning project in which they make recommendations about recreational needs in different types of weather. (SCIENCE).</p> <p><b>Example 2:</b> Students could survey students to develop a data table and graph of favorite meals to help develop a menu. (MATH)</p> <p><b>Example 3:</b> Students could collect a variety of data to create a computational artifact in multiple subject areas.</p>
9-12.CT.2	<p><b>Example 1:</b> Students could gather and analyze data on the mood and tone of different music genres using a variety of different tools. Students could use a web scraper or API to count the frequency of specific words in the song lyrics, a sound sensor to measure pitch, or a digital survey to capture people's moods after listening to each song. (MUSIC)</p> <p><b>Example 2:</b> Students could use computational approaches to pull existing data from other sources to create a computational artifact in multiple subject areas.</p>
K-1.CT.3	<p><b>Example 1:</b> Have students poll the class on their favorite food, color, game etc., then compare bar charts, line and/or pie graphs to best show the information. (MATH)</p> <p><b>Example 2:</b> Students could count and chart the number of pieces of each color of candy in a bag of candy, such as Skittles or M&amp;Ms. (SCIENCE, MATH)</p>
2-3.CT.3	

**9-12.CT.3**

**Example 1:** Students could combine a data set on average household income by zip code and a data set on health by zip code in order to identify differences in occurrences of asthma based on locale and income in order to persuade an audience to take action on environmental social justice issues. (SCIENCE, SOCIAL STUDIES)

## Abstraction and Decomposition

Standard

	bookshelf) and with less (e.g., put away the books) detail without changing the essence of the task.
<b>2-3.CT.5</b>	<b>Example 1:</b> Students could observe that they know how to deliver an item to another classroom just by being told the item and the room number; they do not need to be told how to walk or how to carry the item.
<b>4-6.CT.5</b>	<b>Example 1:</b> Students could tabulate the results of a survey noting that they are asked to compute the sum or average of multiple different columns within a dataset. (MATH)
<b>7-8.CT.5</b>	<b>Example 1:</b> Students can generalize many similar functions to one function such as generalizing individual functions that draw a square, draw a triangle, and draw an octagon to a single function that draws a polygon based on an input for the number of sides. (MATH)
<b>9-12.CT.5</b>	<b>Example 1:</b>



<b>4-6.CT.7</b>	<b>Example 1:</b> Students can explore how their history of recent documents change over the course of time, depending on what files they are opening. Another example can be music applications that track the number of times a song is played.
<b>7-8.CT.7</b>	



<b>K-1.CT.9</b>	<p><b>Example 1:</b> As a class, students could create an algorithm for a classroom task, like sharpening pencils or washing hands, then try out the directions and fix any errors.</p> <p><b>Example 2:</b> Students could use a simple robot to give directions on a grid. If they weren't successful in coding to the right location, the students could state where the bug was and how they can fix it. They can then reprogram the robot to see if their debugging was successful.</p>
<b>2-3.CT.9</b>	<p><b>Example 1:</b></p>







### 7-8.NSD.3

**Example 1:** Students could follow a troubleshooting flowchart that guides them through a process of checking connections and settings, changing software to see if hardware will work, and swapping in working components.

**Example 2:** As a class, students can create a guidebook for next year's students. How to use the programs, what to do if something goes wrong, year-long







Standard Identifier	Examples
4-6.CY.2	







9-

## Digital Use

Standard Identifier	Examples
K-1.DL.1	<p><b>Example 1:</b> Students can practice spelling their name and sight words. (ELA)</p> <p><b>Example 2:</b> Students can use a keyboard to type words beginning with a letter of the alphabet for a class book or presentation. (ELA)</p>
2-3.DL.1	<p><b>Example 1:</b> Students use a keyboard to type a narrative written during a writing workshop to create a class book of stories. (ELA)</p>
4-6.DL.1	<p><b>Example 1:</b> Students use a school-selected online keyboarding program to learn the fundamentals of keyboarding.</p> <p><b>Example 2:</b> Student analyze their rate progress and letters that are challenging</p>

<b>4-6.DL.2</b>	<p><b>Example 1:</b> Students use a school-approved digital tool to type a request to an expert (author, zoologist, museum curator), asking him or her to speak to their classroom; collaboratively generate a list of questions to ask; and connect with the expert over a digital conferencing tool.</p> <p><b>Example 2:</b> Students use a shared online document to provide feedback on peers' work and track changes over time.</p> <p><b>Example 3:</b> Students can use email in an appropriate manner to ask a teacher or other school professional a question. They can state when it is appropriate to email someone versus instant message versus phone call.</p>
<b>7-8.DL.2</b>	<p><b>Example 1:</b> Students communicate through digital conferencing tools with</p>

<p><b>7-8.DL.3</b></p>	<p><b>Example 1:</b> Students compare results when they search on multiple engines; conduct a search, clear their cache/cookies and then conduct a search again; and conduct a search on a mobile device versus a desktop.</p> <p><b>Example 2:</b> Students can compare web searches and databases searches and evaluate how databases are going to produce more reliable results compared to web searches that have to process more data.</p> <p><b>Example 3:</b> Students can experiment with searching with one keyword versus multiple or key phrases.</p>
<p><b>9-12.DL.3</b></p>	<p><b>No Standard; Mastery reached by Grade 8</b></p>
<p><b>K-1.DL.4</b></p>	<p><b>Example 1:</b> Students will begin to use digital tools to create something, like a class presentation or an About Me document. (ELA)</p> <p><b>Example 2:</b> Students could use a digital camera and other tools to create a project about plant growth. (SCIENCE)</p>
<p><b>2-3.DL.4</b></p>	<p><b>Example 1:</b> Student can use presentation software for an individual book report or for a group project. (ELA)</p> <p><b>Example 2:</b> Students could use a variety of digital tools and resources to create, revise and/or publish artifacts in multiple subject areas.</p>
<p><b>4-6.DL.4</b></p>	<p><b>Example 1:</b> Students create a digital story to demonstrate understanding of a concept, such as the branches of government. (SOCIAL STUDIES)</p> <p><b>Example 2:</b> Students can show the life cycle of plants or animals using a presentation tool. (SCIENCE)</p>
<p><b>7-8.DL.4</b></p>	<p><b>Example 1:</b> In collaborative groups, students create anti-cyberbullying commercials and an accompanying infographic for parents on ways they can(e)-48f isgnair</p>



