

Windham School District



K-8 Digital Literacy Curriculum

Approved by the Windham School Board on 1/17/2023

Windham School District Curriculum

Computing and Society: Kindergarten - Grade 2

Stage 1 Desired Results

<p>ESTABLISHED GOALS:</p> <p>Early elementary school students are introduced to foundational concepts by integrating basic digital literacy skills with simple ideas about computational thinking. They learn that digital tools help people do things better, or more easily, or do some things that could otherwise not be done at all. Through the exploration of computing devices and digital tools, students begin to understand if, when, and how they should use technology.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> ● K-2.CAS.a – Safety and Security ● K-2.CAS.a.1 - Demonstrate proper ergonomics (e.g., body position, stretching) when using devices. ● K-2.CAS.a.2 - Use electrical devices safely and in moderation (e.g., unplug devices by pulling the plug rather than the cord, do not mix water/food and electric devices, avoid gaming and walking). ● K-2.CAS.a.3 Care for devices appropriately (e.g., handling devices gently, completely shutting down devices when not in use, storing devices in the appropriate container). ● K-2.CAS.a.4 - Explain that a password helps protect the privacy of information. ● K-2.CAS.a.5 Identify safe and unsafe examples of online communications. ● K-2.CAS.a.6 - Explain why we keep personal information (e.g., name, location, phone number, home address) private. ● K-2.CAS.a.7 - Identify which personal information (e.g., user name or real name, school name or home address) should and should not be shared online and with whom. 	<p><i>Transfer</i></p>		
	<p><i>Students will be able to independently use their learning to...</i></p> <ul style="list-style-type: none"> ● understand basic safety and security concepts and basic understanding of safe information sharing. ● recognize what it means to be a good digital citizen. ● observe and describe how people use technology and how technology can influence people. 		
	<p><i>Meaning</i></p>		
	<table border="1" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>ENDURING UNDERSTANDINGS <i>Students will understand that...</i></p> <ul style="list-style-type: none"> ● there are rules for technology at home and at school. ● personal information (e.g. user name or real-name, school or home address) should not be shared online. ● it is important to talk to an adult (e.g. teacher or parent) about inappropriate electronic content or contact. ● technology impacts society in productive and unproductive ways. ● the purpose of online content can be to influence and persuade users (e.g. advertising). ● people (e.g., students, parents, policemen) use many types of technologies in their daily work and personal lives. </td> <td style="width: 50%; vertical-align: top;"> <p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> ● How is being safe when visiting websites similar to staying safe in real life? ● What types of personal information are private? ● What kinds of information are appropriate to be put online? ● How do you create effective usernames and passwords that protect your private information? ● How does the information you put online leave a digital footprint? ● How do you know which websites are good for you to visit? ● How do you recognize and handle cyberbullying? </td> </tr> </table>	<p>ENDURING UNDERSTANDINGS <i>Students will understand that...</i></p> <ul style="list-style-type: none"> ● there are rules for technology at home and at school. ● personal information (e.g. user name or real-name, school or home address) should not be shared online. ● it is important to talk to an adult (e.g. teacher or parent) about inappropriate electronic content or contact. ● technology impacts society in productive and unproductive ways. ● the purpose of online content can be to influence and persuade users (e.g. advertising). ● people (e.g., students, parents, policemen) use many types of technologies in their daily work and personal lives. 	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> ● How is being safe when visiting websites similar to staying safe in real life? ● What types of personal information are private? ● What kinds of information are appropriate to be put online? ● How do you create effective usernames and passwords that protect your private information? ● How does the information you put online leave a digital footprint? ● How do you know which websites are good for you to visit? ● How do you recognize and handle cyberbullying?
<p>ENDURING UNDERSTANDINGS <i>Students will understand that...</i></p> <ul style="list-style-type: none"> ● there are rules for technology at home and at school. ● personal information (e.g. user name or real-name, school or home address) should not be shared online. ● it is important to talk to an adult (e.g. teacher or parent) about inappropriate electronic content or contact. ● technology impacts society in productive and unproductive ways. ● the purpose of online content can be to influence and persuade users (e.g. advertising). ● people (e.g., students, parents, policemen) use many types of technologies in their daily work and personal lives. 	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> ● How is being safe when visiting websites similar to staying safe in real life? ● What types of personal information are private? ● What kinds of information are appropriate to be put online? ● How do you create effective usernames and passwords that protect your private information? ● How does the information you put online leave a digital footprint? ● How do you know which websites are good for you to visit? ● How do you recognize and handle cyberbullying? 		

<ul style="list-style-type: none"> ● K-2.CAS.a.8 - Explain why it is necessary to report inappropriate electronic content or contact. ● K-2.CAS.b - Ethics and Laws ● K-2.CAS.b.1 – Define good digital citizenship as using technology safely, responsibly, and ethically. ● K-2.CAS.b.2 -Demonstrate responsible use of computers, peripheral devices, and resources as outlined in school rules ● K-2.CAS.b.3 - Explain that most digital artifacts have owners. ● K-2.CAS.b.4 - Explain the importance of giving credit to media creators/owners when using their work. ● K-2.CAS.c – Interpersonal and Societal Impact ● K-2.CAS.c.1 - Identify and describe how people (e.g., students, parents, policemen) use many types of technologies in their daily work and personal lives. ● K-2.CAS.c.2 - Recognize when the purpose of content is to provide information or to influence you to act. 	Acquisition	
<p><i>Students will know...</i></p> <ul style="list-style-type: none"> ● good online citizens keep safe by not sharing personal information. ● people in different jobs use technology in different ways. ● technology can influence people for better or for worse. 	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> ● using and caring for electronic devices safely and appropriately. ● understanding that digital artifacts have owners and the importance of giving creators credit when using their work. ● identifying safe and unsafe examples of online communication. 	
Used in Content Area Standards	21st Century Skills	
Not applicable	<ul style="list-style-type: none"> ● Collaboration ● Communication ● Critical thinking ● Creativity. 	

Windham School District Curriculum

Digital Tools and Collaboration: Kindergarten - Grade 2

Stage 1 Desired Results

<p>ESTABLISHED GOALS:</p> <p>Early elementary school students are introduced to foundational concepts by integrating basic digital literacy skills with simple ideas about computational thinking. They learn that digital tools help people do things better, or more easily, or do some things that could otherwise not be done at all. Through the exploration of computing devices and digital tools, students begin to understand if, when, and how they should use technology.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> ● K-2.DTC.a – Digital Tools ● K-2.DTC.a.1 - Operate a variety of digital tools (e.g., open/close, find, save/print, navigate, use input/output devices). ● K-2.DTC.a.2 - Identify, locate, and use letters, numbers, and special keys on a keyboard (e.g., Space Bar, Shift, Delete). ● K-2.DTC.a.3 - Create a simple digital artifact. ● K-2.DTC.a.4 - Use appropriate digital tools individually and collaboratively to create, review, and revise simple artifacts that include text, images and audio. ● K-2.DTC.b – Collaboration and Communication ● K-2.DTC.b.1 - Collaboratively use digital tools and media resources to communicate key ideas and details in a way that informs, persuades, and/or entertains. ● K-2.DTC.b.2 - Use a variety of digital tools to exchange information and feedback with teachers. ● K-2.DTC.b.3 - Use a variety of digital tools to present information to others. ● K-2.DTC.c – Research 	<i>Transfer</i>	
	<p><i>Students will be able to independently use their learning to...</i></p> <ul style="list-style-type: none"> ● develop basic use of digital tools and research skills to create simple artifacts. ● develop basic use of digital tools to communicate or exchange information. 	
	<i>Meaning</i>	
	<p>ENDURING UNDERSTANDINGS <i>Students will understand that...</i></p> <ul style="list-style-type: none"> ● digital tools can be used individually and collaboratively to create, review, and revise simple artifacts that include text, images, audio and video. ● digital tools and media resources are used to communicate key ideas and details in a way that informs, persuades, and/or entertains. ● digital tools can be used independently and collaboratively to answer a research question. 	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> ● What does it mean to go online and use the internet? ● How does the internet provide a means of communicating with real people? ● How do you choose the appropriate platforms and tools for researching, publishing or presenting content?
	<i>Acquisition</i>	
	<p><i>Students will know...</i></p> <ul style="list-style-type: none"> ● digital tools have a purpose. ● a variety of digital tools are used to exchange ideas, class work and feedback with teachers. 	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> ● utilizing many different ways to produce work using technology. Students will be able to create a document, edit and revise their document, and add images and/or audio. ● navigating a keyboard and trackpad.

<ul style="list-style-type: none"> ● K-2.DTC.c.1 - Conduct basic keyword searches to gather information from teacher-provided digital sources (e.g., online library catalog, databases). ● K-2.DTC.c.2 - Create an artifact individually and collaboratively that answers a research question, while clearly expressing thoughts and ideas. ● K-2.DTC.c.3 - Acknowledge and name sources of information or media (e.g., title of book, author of book, website). 	<ul style="list-style-type: none"> ● ideas, images, and information that are not our own need to be acknowledged as not our own (e.g., title of book, owner of image, author of book, website.) 	<ul style="list-style-type: none"> ● working together online to research, synthesize, and present information using a given program with the intent to convey information, persuade an audience, or entertain (i.e. Google Slides, Docs, Seesaw). ● using keyword searches to gather information from school-provided digital sources (e.g. Destiny catalog, PebbleGo, Epic, BrainPopJr, and others to find the answer to a question or to find information on a given topic. ● students will be able to present their information digitally.
<p><i>Used in Content Area Standards</i></p>		<p><i>21st Century Skills</i></p>
<p>Not applicable</p>		<ul style="list-style-type: none"> ● Collaboration ● Communication ● Critical thinking ● Creativity.

Windham School District Curriculum

Computing Systems: Kindergarten - Grade 2

Stage 1 Desired Results

<p>ESTABLISHED GOALS:</p> <p>Early elementary school students are introduced to foundational concepts by integrating basic digital literacy skills with simple ideas about computational thinking. They learn that digital tools help people do things better, or more easily, or do some things that could otherwise not be done at all. Through the exploration of computing devices and digital tools, students begin to understand if, when, and how they should use technology.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> ● K-2.CS.a – Computing Devices ● K-2.CS.a.1 - Identify different kinds of computing devices in the classroom and other places (e.g., laptops, tablets, smart phones, desktops). ● K-2.CS.a.2 - Identify visible components of computing devices (e.g., keyboard, screen, monitor, printer, pointing device). ● K-2.CS.a.3 - Explain that computing devices function when applications, programs, or commands are executed. ● K-2.CS.a.4 - Operate a variety of computing systems (e.g., turn on, use input/output devices such as a mouse, keyboard, or touch screen; find, navigate, launch a program). ● K-2.CS.b – Human and Computer Partnership ● K-2.CS.b.1 - Explain that computing devices are machines that are not alive, but can be used to help humans with tasks. ● K-2.CS.b.2 - Recognize that some tasks are best 	<i>Transfer</i>	
	<p><i>Students will be able to independently use their learning to...</i></p> <ul style="list-style-type: none"> ● understand that computing devices take many forms and have different components. ● consider the basic structures of computing systems and networks. ● explore human and computer differences to determine when technology is beneficial. 	
	<i>Meaning</i>	
	<p>ENDURING UNDERSTANDINGS <i>Students will understand that...</i></p> <ul style="list-style-type: none"> ● there are similarities in operating a variety of computing systems whether it's the hardware (i.e. phone, tablet, Chromebook, or computer) or software (i.e. Chrome, MS, iOS).. ● the internet relies on networks and algorithms to store and supply information 	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> ● What is a computer? ● What can humans do that computers can't do? ● What would my life and the world be like without computers?
	<i>Acquisition</i>	
<p><i>Students will know...</i></p> <ul style="list-style-type: none"> ● computers consist of hardware and software ● computers are not alive ● computer systems empower people to create, collaborate, and learn. ● networks link computers and devices so people can access and communicate information anywhere in the world. 	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> ● operating 1:1 Chromebooks or ipads independently using school supplied applications that support differentiated learning. 	

<p>completed by humans and others by computing devices (e.g., a human might be able to rescue someone in a normal environment, but robots would be better to use in a dangerous environment).</p> <ul style="list-style-type: none"> ● K-2.CS.b.3 - Recognize that different tools can solve the same problem (e.g., pen and paper, calculators, and smartphones can all be used to solve simple mathematical problems) ● K-2.CS.c – Networks ● K-2.CS.c.1- Explain that networks link computers and devices locally and around the world allowing people to access and communicate information. 		
<i>Used in Content Area Standards</i>		<i>21st Century Skills</i>
Not applicable		<ul style="list-style-type: none"> ● Collaboration ● Communication ● Critical thinking ● Creativity.

Windham School District Curriculum

Computational Thinking: Kindergarten - Grade 2

Stage 1 Desired Results

<p>ESTABLISHED GOALS:</p> <p>Early elementary school students are introduced to foundational concepts by integrating basic digital literacy skills with simple ideas about computational thinking. They learn that digital tools help people do things better, or more easily, or do some things that could otherwise not be done at all. Through the exploration of computing devices and digital tools, students begin to understand if, when, and how they should use technology.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> ● K-2.CT.a – Abstraction ● K-2.CT.a.1 - List the attributes of a common object, for example, cars have a color, type (e.g., pickup, van, sedan), number of seats, etc. ● K-2.CT.b – Algorithms ● K-2.CT.b.1 - Define an algorithm as a sequence of defined steps. ● K-2.CT.b.2 - Create a simple algorithm, individually and collaboratively, without using computers to complete a task (e.g., making a sandwich, getting ready for school, checking a book out of the library). ● K-2.CT.b.3 - Enact an algorithm using tangible materials (e.g., manipulatives, your body) or present the algorithm in a visual medium (e.g., storyboard). ● K-2.CT.c – Data ● K-2.CT.c.1 - Identify different kinds of information (e.g., text, charts, graphs, numbers, pictures, audio, video, collections of objects.) ● K-2.CT.c.2 - Identify, research, and collect information on a topic, issue, problem, or question using age-appropriate digital technologies. 	Transfer	
	<p><i>Students will be able to independently use their learning to...</i></p> <ul style="list-style-type: none"> ● create and enact a simple algorithm. ● understand how information can be collected, used, and presented with computing devices or digital tools. ● create a simple computer “program.” ● use basic models and simulations. 	
	Meaning	
	<p>ENDURING UNDERSTANDINGS</p> <p><i>Students will understand that...</i></p> <ul style="list-style-type: none"> ● digital technology allows people to individually and collaboratively propose a solution to a problem or question based on an analysis of information. ● computational thinking is a problem-solving process to think in new ways to solve problems and create solutions 	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> ● What problems can computers solve and what problems can’t they solve? ● Why is it important to break a complex problem into small pieces?
	Acquisition	
<p><i>Students will know...</i></p> <ul style="list-style-type: none"> ● computer programs provide a means to solve problems. ● algorithms are a sequence of defined steps that can be used to complete a task. ● different kinds of information (e.g. text, 	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> ● collecting data (i.e. what is your favorite lunch) and representing and analyzing their data digitally (i.e. pictograph, bar graph, etc.) ● writing simple code using age 	

<ul style="list-style-type: none"> ● K-2.CT.c.3 - Individually and collaboratively propose a solution to a problem or question based on an analysis of information. ● K-2.CT.c.4 - Individually and collaboratively create information visualizations (e.g., charts, infographics). ● K-2.CT.c.5 - Explain that computers can save information as data that can be stored, searched, retrieved, and deleted. ● K-2.CT.d – Programming and Development ● K-2.CT.d.1 - Define a computer program as a set of commands created by people to do something. ● K-2.CT.d.2 - Explain that computers only follow the program's instructions. ● K-2.CT.d.3 - Individually or collaboratively create a simple program using visual instructions or tools that do not require a textual programming language (e.g., "unplugged" programming activities, a block-based programming language). ● K-2.CT.e – Modeling and Simulation ● K-2.CT.e.1 - Describe how models represent a real-life system (e.g., globe, map, solar system, digital elevation model, weather map). ● K-2.CT.e.2 - Define simulation and identify the concepts illustrated by a simple simulation (e.g., growth and health, butterfly life cycle). 	<p>charts, graphs, pictures, audio, video) can be collected, used, and presented with digital tools.</p>	<p>appropriate coding websites and apps. (i.e. Kodable, code.org, Codespark).</p> <ul style="list-style-type: none"> ● describing how models and simulations represent real-life systems (i.e. Google Earth, online weather map, PHET simulations).
<i>Used in Content Area Standards</i>		<i>21st Century Skills</i>
Not applicable		<ul style="list-style-type: none"> ● Collaboration ● Communication ● Critical thinking ● Creativity.

Windham School District Curriculum

Computing and Society: Grades 3 - 5

Stage 1 Desired Results

<p>ESTABLISHED GOALS:</p> <p>Upper elementary students learn to differentiate tasks that are best done by computing systems or digital tools and those best done by humans. Students explore a variety of computing devices and digital tools and further develop their computational thinking problem solving skills. As students progress through grades 3–5, they begin to evaluate the uses and limitations of existing artifacts and modify parts of existing artifacts to develop something new. Students are able to describe and document their computational work in writing, using presentation tools and through demonstrations of their work.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> ● 3-5.CAS.a – Safety and Security ● 3-5.CAS.a.1- Describe how to use proper ergonomics (e.g., body position, lighting, positioning of equipment, taking breaks) when using devices. ● 3-5.CAS.a.2 - Describe the threats to safe and efficient use of devices (e.g., SPAM, spyware, phishing, viruses) associated with various forms of technology use (e.g., downloading and executing software programs, following hyperlinks, opening files). ● 3-5.CAS.a.3 - Identify appropriate and inappropriate uses of technology when posting to social media, sending email or texts, and browsing the Internet. 	<i>Transfer</i>	
	<p><i>Students will be able to independently use their learning to...</i></p> <ul style="list-style-type: none"> ● understand safety and security concepts, safe and appropriate use of technology, and how to deal with cyberbullying. ● demonstrate responsible use of technology, digital content, and interactions. ● observe and describe how technology can influence people. ● basic understanding of digital media messaging and equity of access to technology. 	
	<i>Meaning</i>	
<p>ENDURING UNDERSTANDINGS</p> <p><i>Students will understand that...</i></p> <ul style="list-style-type: none"> ● the proper use and operation of security technologies (e.g., passwords, virus protection software, spam filters, pop-up blockers, cookies) keeps digital information safe. ● it is important to employ safe practices and avoid the potential risks/dangers associated with various forms of online communications, downloads, linking, Internet purchases, advertisements, and inappropriate content within constrained environments. ● the school district’s Acceptable Use Policy requires the responsible use of computers, peripheral devices, and resources. ● there are possible consequences for the inappropriate use of digital artifacts that are protected by copyright. ● access to technology helps empower individuals and groups (e.g., gives them access to information, 	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> ● How can you identify if you or a friend is being cyberbullied? ● What are some strategies for dealing with cyberbullying responsibly? ● How is giving credit a sign of respect for others’ work? ● Compare and contrast your responsibilities to your online and offline communities (in person versus digital interactions). ● How does technology help empower individuals and groups? 	

<ul style="list-style-type: none"> ● 3-5.CAS.a.4 - Explain the proper use and operation of security technologies (e.g., passwords, virus protection software, spam filters, popup blockers, cookies). ● 3-5.CAS.a.5 - Describe ways to employ safe practices and avoid the potential risks/dangers associated with various forms of online communications, downloads, linking, Internet purchases, advertisements, and inappropriate content within constrained environments. ● 3-5.CAS.a.6 - Identify different types of cyberbullying (e.g., harassment, flaming, excluding people, outing, and impersonation). ● 3-5.CAS.a.7 - Explain that if you encounter cyberbullying or other inappropriate content, you should immediately tell a responsible adult (e.g., teacher, parent). 3 ● 3-5.CAS.b – Ethics and Laws ● 3-5.CAS.b.1 - Demonstrate responsible use of computers, peripheral devices, and resources as outlined in school rules (Acceptable Use Policy [AUP]). ● 3-5.CAS.b.2 - Describe the difference between digital artifacts that are open or free and those that are protected by copyright. ● 3-5.CAS.b.3 - Explain the guidelines for the fair use of downloading, sharing, or modifying of digital artifacts. ● 3-5.CAS.b.4 - Describe the purpose of copyright and the possible consequences for inappropriate use of digital artifacts that are protected by copyright. ● 3-5.CAS.b.5 - Explain that laws exist (e.g., Section 508, Telecommunication Act of 1996) that help ensure that people with disabilities can access electronic and information technology. ● 3-5.CAS.c – Interpersonal and Societal Impact ● 3-5.CAS.c.1 - Explain the different forms of web 	<p>the ability to communicate with others around the world, allows them to buy and sell things).</p> <ul style="list-style-type: none"> ● social media and cyberbullying can have a negative impact not only on individuals but on families and society. 	
Acquisition		
	<p><i>Students will know...</i></p> <ul style="list-style-type: none"> ● technology equipment should be used correctly and responsibly and there are rules to use technology at school (and at home). ● the limits of copyright and how to correctly cite sources in work they complete. ● the impact of cyberbullying and how to deal with it. 	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> ● explaining why it is important to not share passwords. ● using technology and equipment correctly and responsibly. Students should also be able to show that they understand the rules. ● cite sources used in projects accurately and correctly. ● recognizing the elements of a website URL (i.e. name of the site, web address, domain, and extensions). ● communicating with others safely and responsibly by using online platforms. ● recognizing cyberbullying as the repeated use of technology to harass, threaten, or intimidate someone.

<p>advertising (e.g., search ads, pay-per-click ads, banner ads, targeted ads, in-game ads, email ads)</p> <ul style="list-style-type: none"> ● 3-5.CAS.c.2 - Explain why websites, digital resources, and artifacts may include advertisements and collect personal information. ● 3-5.CAS.c.3 - Define the digital divide as unequal access to technology on the basis of differences, such as income, education, age, and geographic location. ● 3-5.CAS.c.4 - Use critical thinking to explain how access to technology helps empower individuals and groups (e.g., gives them access to information, the ability to 		
<p><i>Used in Content Area Standards</i></p>		<p><i>21st Century Skills</i></p>
<p>Not applicable</p>		<ul style="list-style-type: none"> ● Collaboration ● Communication ● Critical thinking ● Creativity.

Windham School District Curriculum

Digital Tools and Collaboration: Grades 3 - 5

Stage 1 Desired Results

<p>ESTABLISHED GOALS:</p> <p>Upper elementary students learn to differentiate tasks that are best done by computing systems or digital tools and those best done by humans. Students explore a variety of computing devices and digital tools and further develop their computational thinking problem solving skills. As students progress through grades 3–5, they begin to evaluate the uses and limitations of existing artifacts and modify parts of existing artifacts to develop something new. Students are able to describe and document their computational work in writing, using presentation tools and through demonstrations of their work.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> ● 3-5.DTC.a – Digital Tools ● 3-5.DTC.a.1 - Type five words-per-minute times grade level (e.g., for Grade 5, type 25 words/minute). ● 3-5.DTC.a.2 - Navigate between local, networked, or online/cloud environments and transfer files between each (upload/download). ● 3-5.DTC.a.3 - Use digital tools (local and online) to manipulate and publish multimedia artifacts. 3 ● 3-5.DTC.b – Collaboration and Communication ● 3-5.DTC.b.1 - Communicate key ideas and details individually or collaboratively in a way that informs, persuades, and/or entertains using digital tools and media-rich resources. ● 3-5.DTC.b.2 - Collaborate through online digital tools under teacher supervision. ● 3-5.DTC.c - Research ● 3-5.DTC.c.1 - Identify digital information sources to answer research questions (e.g., online library catalog, online encyclopedias, databases, websites). 	Transfer	
	<p><i>Students will be able to independently use their learning to...</i></p> <ul style="list-style-type: none"> ● use digital tools and keyboarding skills to publish multimedia artifacts. ● use digital tools to communicate or exchange information. ● develop intermediate research skills to create artifacts and attribute credit. 	
	Meaning	
	<p>ENDURING UNDERSTANDINGS <i>Students will understand that...</i></p> <ul style="list-style-type: none"> ● digital tools can be used to communicate key ideas and details individually or collaboratively in a way that informs, persuades, and/or entertains using digital tools and media-rich resources ● digital resources should be evaluated for accuracy, relevancy, and appropriateness. 	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> ● What are the norms for collaborating in the classroom? ● How do students participate responsibly and respectfully in an online community? ● What kinds of creative work can students make or share digitally? ● Is it fair to share others' creative work without giving credit?
Acquisition		
<p><i>Students will know...</i></p> <ul style="list-style-type: none"> ● artifacts can be created and published using digital tools. ● ideas and details can be communicated individually or collaboratively in a way that 	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> ● typing documents throughout the school year in all subjects. Goal is to achieve five words-per-minute times grade level (e.g., for Grade 5, type 25 words/minute) 	

<ul style="list-style-type: none"> ● 3-5.DTC.c.2 - Perform searches to locate information using two or more keywords and techniques to refine and limit such searches. ● 3-5.DTC.c.3 - Evaluate digital sources for accuracy, relevancy, and appropriateness. ● 3-5.DTC.c.4 - Gather and organize information from digital sources by quoting, paraphrasing, and/or summarizing. ● 3-5.DTC.c.5 - Create an artifact that answers a research question and clearly communicates thoughts and ideas. ● 3-5.DTC.c.6 - Cite text-based sources using a school- or district-adopted format. ● 3-5.DTC.c.7 - Provide basic source information (e.g., Uniform Resource Locator [URL], date accessed) for non-text-based sources (e.g., images, audio, video). 	<p>informs, persuades, and/or entertains using digital tools and media-rich resources.</p> <ul style="list-style-type: none"> ● digital sources should be evaluated for accuracy, relevancy, and appropriateness. 	<ul style="list-style-type: none"> ● touch-typing letters on the keyboard with both hands using home row keys while demonstrating proper keyboarding techniques for speed and accuracy. ● publishing information in a variety of forms using a variety of digital tools. ● communicating and sharing their understanding or knowledge of a topic. ● working together on a collaborative project using Google Apps. ● determining which website is appropriate for their age and content. ● citing sources.
<p><i>Used in Content Area Standards</i></p>		<p><i>21st Century Skills</i></p>
<p>Not applicable</p>		<ul style="list-style-type: none"> ● Collaboration ● Communication ● Critical thinking ● Creativity.

Windham School District Curriculum

Computing Systems: Grades 3 - 5

Stage 1 Desired Results

ESTABLISHED GOALS:

Upper elementary students learn to differentiate tasks that are best done by computing systems or digital tools and those best done by humans. Students explore a variety of computing devices and digital tools and further develop their computational thinking problem solving skills. As students progress through grades 3–5, they begin to evaluate the uses and limitations of existing artifacts and modify parts of existing artifacts to develop something new. Students are able to describe and document their computational work in writing, using presentation tools and through demonstrations of their work.

Content Standards:

- 3-5.CS.a – **Computing Devices**
- 3-5.CS.a.1 - Identify a broad range of computing devices (e.g., computers, smart phones, tablets, robots, e-textiles) and appropriate uses for them.
- 3-5.CS.a.2 - Describe the function and purpose of various input and output devices (e.g., monitor, keyboard, speakers, controller, probes, sensors, Bluetooth transmitters, synthesizers).
- 3-5.CS.a.3 - Demonstrate an appropriate level of proficiency (connect and record data, print, send command, connect to Internet, search) in using a range of computing devices (e.g., probes, sensors, printers, robots, computers).
- 3-5.CS.a.4 - Identify and solve simple hardware and software problems that may occur during everyday use (e.g., power, connections, application window or toolbar).
- 3-5.CS.a.5 - Describe the differences between hardware and software.
- 3-5.CS.a.6 - Identify and explain that some computing functions are always active (e.g., locations function on smartphones).
- 3-5.CS.b – **Human and Computer Partnerships**

Transfer

Students will be able to independently use their learning to...

- understand different computing devices and their components.
- use different computing devices and troubleshoot and solve simple problems.
- differentiate tasks that are best done by computing systems and humans.
- understand the components of a network and basic network authentication.
- basic understanding of services.

Meaning

ENDURING UNDERSTANDINGS

Students will understand that...

- people and devices are connected to each other on the internet via networks.
- computing systems take many forms (i.e. cars, medical devices, robots), not just personal computers, phones or tablets.

ESSENTIAL QUESTIONS

- What is a computer?
- What can humans do that computers can't do?
- What would my life and the world be like without computers?

Acquisition

Students will know...

- differences between hardware and software.
- hardware and software applications can enable everyone, including people with disabilities,

Students will be skilled at...

- saving and retrieving a document from a folder.
- naming and creating folders.
- performing a web search on a topic and determining the best

<ul style="list-style-type: none"> ● 3-5.CS.b.1 - Compare and contrast human and computer performance on similar tasks (e.g., sorting alphabetically, finding a path across a cluttered room) to understand which is best suited to the task. ● 3-5.CS.b.2 - Explain how hardware and applications (e.g., Global Positioning System [GPS] navigation for driving directions, text-to-speech translation, language translation) can enable everyone, including people with disabilities, to do things they could not do otherwise. ● 3-5.CS.b.3 - Explain advantages and limitations of technology (e.g., a spell-checker can check thousands of words faster than a human could look them up, however, a spell-checker might not know whether 'underserved' is correct or if the author's intent was to type 'undeserved'). ● 3-5.CS.c – Networks ● 3-5.CS.c.1 - Describe how a network is made up of a variety of components and identify the common components (e.g., links, nodes, networking devices). ● 3-5.CS.c.2 - Describe the need for authentication of users and devices as it relates to access permissions, privacy, and security. ● 3-5.CS.c.3 - Define and explain why devices are numbered/labeled in networks (e.g., the World Wide Web Uniform Resource Locator [URL], the Internet Protocol [IP] address, the Machine Access Code [MAC]). ● 3-5.CS.c.4 - Recognize that there are many sources of and means for accessing information within a network (e.g., websites, e-mail protocols, search engines) ● 3-5.CS.d – Services ● 3-5.CS.d.1 - Identify common services (e.g., driving directions apps that access remote map services, digital personal assistants that access remote information services). 	<p>to do things they could not do otherwise.</p> <ul style="list-style-type: none"> ● there are many sources of and means for accessing information within a network (i.e. websites, email). 	<p>sources to use for the assigned topic.</p> <ul style="list-style-type: none"> ● using basic troubleshooting techniques. ● using a variety of software programs appropriately.
<p><i>Used in Content Area Standards</i></p>		<p><i>21st Century Skills</i></p>
<p>Not applicable</p>		<ul style="list-style-type: none"> ● Collaboration ● Communication ● Critical thinking ● Creativity.

Windham School District Curriculum

Computational Thinking: Grades 3 - 5

Stage 1 Desired Results

<p>ESTABLISHED GOALS:</p> <p>Upper elementary students learn to differentiate tasks that are best done by computing systems or digital tools and those best done by humans. Students explore a variety of computing devices and digital tools and further develop their computational thinking problem solving skills. As students progress through grades 3–5, they begin to evaluate the uses and limitations of existing artifacts and modify parts of existing artifacts to develop something new. Students are able to describe and document their computational work in writing, using presentation tools and through demonstrations of their work.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> ● 3-5.CT.a – Abstraction ● 3-5.CT.a.1 - Use numbers or letters to represent information in another form (e.g., secret codes, Roman numerals, abbreviations). ● 3-5.CT.a.2 - Organize information in different ways to make it more useful/relevant (e.g., sorting, tables). ● 3-5.CT.a.3 - Make a list of sub-problems to consider, while addressing a larger problem. ● 3-5.CT.b – Algorithms ● 3-5.CT.b1 - Define an algorithm as a sequence of instructions that can be processed by a computer. ● 3-5.CT.b2 - Recognize that different solutions exist for the same problem (or sub-problem) ● 3-5.CT.b3 - Use logical reasoning to predict outcomes of an algorithm. ● 3-5.CT.b4 - Individually and collaboratively create an algorithm to solve a problem (e.g., move a 	<i>Transfer</i>	
	<p><i>Students will be able to independently use their learning to...</i></p> <ul style="list-style-type: none"> ● create a new representation by breaking down a larger problem into subproblems. ● understand that databases organize and transform data. ● write, debug, and correct programs using successively sophisticated techniques. ● create a model and analyze data from a simulation. 	
	<i>Meaning</i>	
	<p>ENDURING UNDERSTANDINGS <i>Students will understand that...</i></p> <ul style="list-style-type: none"> ● there are strategies for understanding and solving problems using the power of technology (i.e. break problems into smaller parts, use algorithmic thinking to develop a sequence of steps). ● a computer’s ability to rapidly and precisely execute programs makes new ways of designing and problem solving possible. 	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> ● What problems can computers solve and what can’t they solve? ● Can different solutions exist for the same problem?
	<i>Acquisition</i>	
<p><i>Students will know...</i></p> <ul style="list-style-type: none"> ● technology resources are used to organize and present information digitally. ● logical reasoning is used to create an algorithm to solve a problem (i.e. using 	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> ● organizing information in different ways to make it more useful (i.e. sorting/tables). ● using graphic organizers to sequence and organize 	

<p>character/robot/person through a maze).</p> <ul style="list-style-type: none"> ● 3-5.CT.b5 - Detect and correct logical errors in various algorithms (e.g., written, mapped, live action, or digital). ● 3-5.CT.c – Data ● 3-5.CT.c.1 - Describe examples of databases from everyday life (e.g., library catalogs, school records, telephone directories, contact lists) ● 3-5.CT.c.2 - Collect and manipulate data to answer a question using a variety of computing methods (e.g., sorting, totaling, averaging) and tools (such as a spreadsheet) to collect, organize, graph, and analyze data. ● 3-5.CT.d – Programming and Development ● 3-5.CT.d.1 - Individually and collaboratively create, test, and modify a program in a graphical environment (e.g., block-based visual programming language). ● 3-5.CT.d.2 - Use arithmetic operators, conditionals, and repetition in programs. ● 3-5.CT.d.3 - Use interactive debugging to detect and correct simple program errors. ● 3-5.CT.d.4 - Recognize that programs need known starting values (e.g., set initial score to zero in a game). ● 3-5.CT.e – Modeling and Simulation ● 3-5.CT.e.1 - Individually and collaboratively create a simple model of a system (e.g., water cycle, solar system) and explain what the model shows and does not show. ● 3-5.CT.e.2 - Identify the concepts, features, and behaviors illustrated by a simulation (e.g., object motion, weather, ecosystem, predator/prey) and those that were not included. ● 3-5.CT.e.3 - Individually and collaboratively use data from a simulation to answer a question. 	<p>code to move a robot through a maze).</p> <ul style="list-style-type: none"> ● data is collected and manipulated to answer a question using a variety of computer methods (i.e. sorting) and tools (i.e. spreadsheet). 	<p>information.</p> <ul style="list-style-type: none"> ● using coding apps to create algorithms to solve problems.
<p>Used in Content Area Standards</p>		<p>21st Century Skills</p>
<p>Not applicable</p>		<ul style="list-style-type: none"> ● Collaboration ● Communication ● Critical thinking ● Creativity.

Windham School District Curriculum

Computing and Society: Grades 6 - 8

Stage 1 Desired Results

ESTABLISHED GOALS:

The goal for middle school students is to define problems more precisely, to conduct a more thorough process of selecting the best devices, tools, and solutions. Students learn to differentiate problems or sub-problems that are best solved by computing systems or digital tools and those best solved by humans. Students further develop their computational thinking problem solving skills, which facilitates the use of technology.

Content Standards:

- 6-8.CAS.a – **Safety and Security**
- 6-8.CAS.a.1 - Identify threats and actively protect devices and networks from viruses, intrusion, vandalism, and other malicious activities.
- 6-8.CAS.a.2 - Describe how cyberbullying can be prevented and managed
- 6-8.CAS.a.3- Explain the connection between the persistence of data on the Internet, personal online identity, and personal privacy
- 6-8.CAS.a.4 - Describe and use safe, appropriate, and responsible practices (netiquette) when participating in online communities (e.g., discussion groups, blogs, social networking sites).
- 6-8.CAS.a.5 - Differentiate between appropriate and inappropriate content on the Internet.
- **6-8.CAS.b – Ethics and Laws**
- 6-8.CAS.b.1 - Explain how copyright law and licensing protect the owner of intellectual property.
- 6-8.CAS.b.2 - Explain possible consequences of violating intellectual property law and plagiarism.
- 6-8.CAS.b.3 - Apply fair use for using copyrighted materials (e.g., images, music, video, text).
- 6-8.CAS.b.4 - Identify the legal consequences of sending or

Transfer

Students will be able to independently use their learning to...

- understand safety and security concepts, online identity and privacy, and how to deal with cyberbullying and inappropriate content.
- demonstrate responsible use of technology and laws regarding ownership of material/ideas, licensing, and fair use.
- understand consequences of inappropriate technology use, including harassment and sexting.
- examine the impact of emerging technology in schools, communities, and societies.
- evaluate digital media bias and messaging.

Meaning

ENDURING UNDERSTANDINGS
Students will understand that...

- students understand how to practice appropriate digital citizenship. Digital Citizenship is creating, participating in, and observing online content with empathy.
- students can identify appropriate and inappropriate content on the internet, and know what to do when they see it.
- students have a general understanding of technology's local and global impact.
- students can distinguish when and

ESSENTIAL QUESTIONS

- What can we do to keep ourselves safe in our social media environments?
- What are the opportunities/pitfalls of connecting with people online?
- What can we do to stand up against bullying and cyberbullying?
- How can we manage and minimize the negative impact of our “digital footprint”?
- How can we preserve and protect our health when using technology?
- How can we use technology and

<p>receiving inappropriate content (e.g., cyberbullying, harassment, sexting).</p> <ul style="list-style-type: none"> ● 6-8.CAS.b.5 - Differentiate among open source and proprietary software licenses and their applicability to different types of software and media. ● 6-8.CAS.b.6 - Demonstrate compliance with the school's Acceptable Use Policy [AUP]. ● 6-8.CAS.b.7 - Identify software license agreements and application permissions. ● 6-8.CAS.b.8 - Explain positive and malicious purposes of hacking. ● 6-8.CAS.b.9 - License original content and extend license for sharing in the public domain (e.g., creative commons). ● 6-8.CAS.c – Interpersonal and Societal Impact ● 6-8.CAS.c.1 - Describe current events and emerging technologies in computing and the effects they may have on education, the workplace, individuals, communities, and global society. ● 6-8.CAS.a.2 - Identify and discuss the technology proficiencies needed in the classroom and the workplace, and how to meet the needs ● 6-8.CAS.c.3 - Relate the distribution of computing resources in a global society to issues of equity, access, and power. ● 6-8.CAS.c.4 - Evaluate how media and technology can be used to distort, exaggerate, and misrepresent information. ● 6-8.CAS.c.5 - Evaluate the bias of digital information sources, including websites. 	<p>the ways in which misinformation is spread via the media and technology.</p> <ul style="list-style-type: none"> ● students can identify biases when using digital content and analyze in what ways those biases influence that content. 	<p>teamwork to help local communities?</p>
Acquisition		
	<p><i>Students will know...</i></p> <ul style="list-style-type: none"> ● understand what cyberbullying is, ways in which it can be avoided, and what to do when it is occurring. ● <i>Awareness of the school acceptable use policy</i> ● Students understand content creators are owed credit and there are laws protecting that right 	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> ● Students act in accordance with the school's Acceptable Use Policy. ● Students are expected to apply Creative Commons licenses to their original content.
Used in Content Area Standards		21st Century Skills
<p>Not applicable</p>		<ul style="list-style-type: none"> ● Collaboration ● Communication ● Critical thinking ● Creativity.

Windham School District Curriculum

Digital Tools and Collaboration: Grades 6 - 8

Stage 1 Desired Results

<p>ESTABLISHED GOALS:</p> <p>The goal for middle school students is to define problems more precisely, to conduct a more thorough process of selecting the best devices, tools, and solutions. Students learn to differentiate problems or sub-problems that are best solved by computing systems or digital tools and those best solved by humans. Students further develop their computational thinking problem solving skills, which facilitates the use of technology.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> ● 6-8.DTC.a – Digital Tools ● 6-8.DTC.a.1 - Identify and explain the strengths, weaknesses, and capabilities of a variety of digital tools. ● 6-8.DTC.a.2 - Identify the kinds of content associated with different file types and why different file types exist (e.g., formats for word processing, images, music, three-dimensional drawings.). ● 6-8.DTC.a.3 - Integrate information from multiple file formats into a single artifact. ● 6-8.DTC.a.4 - Individually and collaboratively use advanced tools to design and create online content (e.g., digital portfolio, multimedia, blog, webpage). ● 6-8.DTC.a.5 - Individually and collaboratively develop and conduct an online survey. ● 6-8.DTC.b – Collaboration and Communication ● 6-8.DTC.b.1 - Communicate and publish key ideas and details individually or collaboratively in a way that informs, persuades, and/or entertains using a variety of digital tools and media-rich resources. ● 6-8.DTC.b.2 - Collaborate synchronously and asynchronously 	<i>Transfer</i>		
	<p><i>Students will be able to independently use their learning to...</i></p> <ul style="list-style-type: none"> ● use a variety of digital tools to create artifacts, online content, and online surveys. ● understand that different digital tools have different uses. ● communicate and publish online. ● advance research skills. 		
	<i>Meaning</i>		
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;"> <p style="text-align: center; font-weight: bold;">ENDURING UNDERSTANDINGS</p> <p><i>Students will understand that...</i></p> <ul style="list-style-type: none"> ● students should be able to find and discern between credible and untrustworthy online sources. </td> <td style="width: 50%; padding: 5px;"> <p style="text-align: center; font-weight: bold;">ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> ● What strategies can we use to evaluate material found online? ● How will we show appreciation and respect for any intellectual property provided for free online? ● How can I share my interests and skills with others? </td> </tr> </table>	<p style="text-align: center; font-weight: bold;">ENDURING UNDERSTANDINGS</p> <p><i>Students will understand that...</i></p> <ul style="list-style-type: none"> ● students should be able to find and discern between credible and untrustworthy online sources. 	<p style="text-align: center; font-weight: bold;">ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> ● What strategies can we use to evaluate material found online? ● How will we show appreciation and respect for any intellectual property provided for free online? ● How can I share my interests and skills with others?
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	<i>Acquisition</i>		
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;"> <p><i>Students will know...</i></p> <ul style="list-style-type: none"> ● students will understand that content has a specific purpose that connects students to their audiences. </td> <td style="width: 50%; padding: 5px;"> <p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> ● students utilize a variety of different resources (video, audio, text) to inform a single project. ● students work individually and/or collaboratively to create original online content using apps and extensions, such as the Google Suite. Online </td> </tr> </table>	<p><i>Students will know...</i></p> <ul style="list-style-type: none"> ● students will understand that content has a specific purpose that connects students to their audiences. 	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> ● students utilize a variety of different resources (video, audio, text) to inform a single project. ● students work individually and/or collaboratively to create original online content using apps and extensions, such as the Google Suite. Online
<p><i>Students will know...</i></p> <ul style="list-style-type: none"> ● students will understand that content has a specific purpose that connects students to their audiences. 	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> ● students utilize a variety of different resources (video, audio, text) to inform a single project. ● students work individually and/or collaboratively to create original online content using apps and extensions, such as the Google Suite. Online 		

<p>through online digital tools.</p> <ul style="list-style-type: none"> ● 6-8.DTC.b.3 - Demonstrate ability to communicate appropriately through various online tools (e.g., e-mail, social media, texting, blog comments). ● 6-8.DTC.c – Research ● 6-8.DTC.c.1 - Perform advanced searches to locate information using a variety of digital sources (e.g., Boolean Operators, limiters like reading level, subject, media type). ● 6-8.DTC.c.2 - Evaluate quality of digital sources for reliability, including currency, relevancy, authority, accuracy, and purpose of digital information. ● 6-8.DTC.c.3 - Gather, organize, and analyze information from digital sources by quoting, paraphrasing, and/or summarizing. ● 6-8.DTC.c.4 - Create an artifact, individually and collaboratively, that answers a research question and communicates results and conclusions. ● 6-8.DTC.c.5 - Use digital citation tools to cite sources using a school- or district-adopted format (e.g., Modern Language Association [MLA]), including proper citation for all text and non-text sources (e.g., images, audio, video). 		<p>content includes, but is not limited to, Google Sites, class Youtube channels, class social media accounts, etc.</p> <ul style="list-style-type: none"> ● students answer a research question through responsibly collected sources to create a product that demonstrates understanding of the skills ● typing documents throughout the school year in all subjects. Goal is to achieve five words-per-minute times grade level (e.g., for Grade 7, type 35 words/minute; Grade 8, type 40 words/minute)
<p><i>Used in Content Area Standards</i></p>		<p><i>21st Century Skills</i></p>
<p>Not applicable</p>		<ul style="list-style-type: none"> ● Collaboration ● Communication ● Critical thinking ● Creativity.

Windham School District Curriculum

Computing Systems: Grades 6 - 8

Stage 1 Desired Results

<p>ESTABLISHED GOALS:</p> <p>The goal for middle school students is to define problems more precisely, to conduct a more thorough process of selecting the best devices, tools, and solutions. Students learn to differentiate problems or sub-problems that are best solved by computing systems or digital tools and those best solved by humans. Students further develop their computational thinking problem solving skills, which facilitates the use of technology.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> ● 6-8.CS.a – Computing Devices ● 6-8.CS.a.1 - Describe the main functions of an operating system. ● 6-8.CS.a.2 - Recognize that there is a wide range of application software. ● 6-8.CS.a.3 - Identify and describe the function of the main internal parts of a basic computing device (e.g., motherboard, hard drive, Central Processing Unit [CPU]). ● 6-8.CS.a.4 - Identify and describe the use of sensors, actuators, and control systems in an embodied system (e.g., a robot, an e-textile, installation art, smart room). ● 6-8.CS.a.5 - Individually and collaboratively design and demonstrate the use of a device (e.g., robot, e-textile) to accomplish a task. ● 6-8.CS.a.6 - Use a variety of computing devices (e.g., probes, sensors, handheld devices, Global Positioning System [GPS]) to individually and collaboratively collect, analyze, and present information for content-related problems. ● 6-8.CS.a.7 - Identify steps involved in diagnosing and solving routine hardware and software problems (e.g., power, 	Transfer	
	<p><i>Students will be able to independently use their learning to...</i></p> <ul style="list-style-type: none"> ● understand hardware and software components of a computing device; troubleshoot hardware and software problems. ● use a variety of computing devices to manipulate data. ● differentiate tasks/problems best solved by computing systems or by humans. ● understand that network components carry out specific functions to connect computing devices, people, and services. ● understand the capabilities services can provide. 	
	Meaning	
	<p>ENDURING UNDERSTANDINGS <i>Students will understand that...</i></p> <ul style="list-style-type: none"> ● students understand how technology is used by people to accomplish tasks too complicated for humans to do alone and too creative for technology to do alone. 	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> ● What is a computer? ● What can humans do that computers can't do (yet)? ● What would my life and the world be like without computers?
	Acquisition	
<p><i>Students will know...</i></p> <ul style="list-style-type: none"> ● identify steps involved in diagnosing and solving routine hardware and software problems (e.g., power, connections, application window or toolbar, cables, ports, network resources, video, sound) that occur 	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> ● students can use technology to build, program, and/or engineer a device to accomplish a task. ● students understand the steps to basic troubleshooting with regards to classroom technology (chromebooks, 	

<p>connections, application window or toolbar, cables, ports, network resources, video, sound) that occur during everyday computer use.</p> <ul style="list-style-type: none"> ● 6-8.CS.b – Human and Computer Partnerships ● 6-8.CS.b.1 - Explain why some problems can be solved more easily by computers or humans based on a general understanding of types of tasks at which each excels. ● 6-8.CS.b.2 - Describe how humans and machines interact to solve problems that cannot be solved by either alone (e.g., "big data" experiments that involve drawing conclusions by analyzing vast amounts of data). ● 6-8.CS.c – Networks ● 6-8.CS.c.1 – Explain the difference between physical (wired), local and wide area, wireless, and mobile networks. ● 6-8.CS.c.2 – Model the components of a network, including devices, routers, switches, cables, wires, and transponders. ● 6-8.CS.c.3 – Describe how information, both text and non-text, is translated and communicated between digital devices over a computer network. ● 6-8.CS.d - Services ● 6-8.CS.d.1 - Identify capabilities of devices that are enabled through services (e.g., a wearable device that stores fitness data in the cloud, a mobile device that uses location services for navigation). 	<p>during everyday computer use.</p> <ul style="list-style-type: none"> ● describe how humans and machines interact to solve problems that cannot be solved by either alone (e.g., "big data" experiments that involve drawing conclusions by analyzing vast amounts of data). ● identify capabilities of devices that are enabled through services (e.g., a wearable device that stores fitness data in the cloud, a mobile device that uses location services for navigation). 	<p>iPads, smartphones, etc.)</p> <ul style="list-style-type: none"> ● students understand how services (GPS, cloud-based info, camera, etc.) are utilized by their devices to achieve device-specific goals. ● individually and collaboratively design and demonstrate the use of a device (e.g., robot, e-textile) to accomplish a task.
<p><i>Used in Content Area Standards</i></p>		<p><i>21st Century Skills</i></p>
<p>Not applicable</p>		<ul style="list-style-type: none"> ● Collaboration ● Communication ● Critical thinking ● Creativity.

Windham School District Curriculum

Computational Thinking: Grades 6 - 8

Stage 1 Desired Results

ESTABLISHED GOALS:

The goal for middle school students is to define problems more precisely, to conduct a more thorough process of selecting the best devices, tools, and solutions. Students learn to differentiate problems or sub-problems that are best solved by computing systems or digital tools and those best solved by humans. Students further develop their computational thinking problem solving skills, which facilitates the use of technology.

Content Standards:

- **6-8.CT.a - Abstraction**
- 6-8.CT.a.1 - Describe how data is abstracted by listing attributes of everyday items to represent, order and compare those items (e.g., street address as an abstraction for locations; car make, model, and license plate number as an abstraction for cars).
- 6-8.CT.a.2 - Define a simple function that represents a more complex task/problem and can be reused to solve similar tasks/problems.
- 6-8.CT.a.3 - Use decomposition to define and apply a hierarchical classification scheme to a complex system, such as the human body, animal classification, or in computing.
- **6-8.CT.b – Algorithms**
- 6-8.CT.b.1 - Design solutions that use repetition and conditionals.
- 6-8.CT.b.2 - Use logical reasoning to predict outputs given varying inputs.
- 6-8.CT.b.3 - Individually and collaboratively decompose a problem and create a sub-solution for each of its

Transfer

Students will be able to independently use their learning to...

- create a new representation, define functions, and use decomposition.
- write, debug, and analyze advanced algorithms and basic programs.
- understand how computing devices represent and manipulate information.
- create, modify, and manipulate databases.
- use a variety of data collection devices.
- create a model and use and modify a simulation for analysis.

Meaning

ENDURING UNDERSTANDINGS

Students will understand that...

- computing enables people to use creative development processes to create computational artifacts for creative expressions or to solve a problem.

ESSENTIAL QUESTIONS

- What problems can computers solve and what can't they solve?

Acquisition

Students will know...

- define a simple function that represents a more complex task/problem and can be reused to solve similar tasks/problems.
- individually and collaboratively decompose a problem and create a sub-solution for each of its parts (e.g., video game, robot obstacle course, making dinner).

Students will be skilled at...

- students can identify patterns and similarities (functions) in larger processes, and can see that pattern or similarity at work in other places.
- students can break down a complex problem into simpler pieces and then solve those simpler pieces.
- students can apply learned functions to new situations and predict what is going

<p>parts (e.g., video game, robot obstacle course, making dinner).</p> <ul style="list-style-type: none"> ● 6-8.CT.b.4 - Recognize that more than one algorithm can solve a given problem. ● 6-8.CT.b.5 - Recognize that boundaries need to be taken into account for an algorithm to produce correct results. ● 6-8.CT.c – Data ● 6-8.CT.c.1 – Demonstrate that numbers can be represented in different base systems (e.g., binary, octal, and hexadecimal) and text can be represented in different ways (e.g., American Standard Code for Information Interchange [ASCII]). ● 6-8.CT.c.2 – Describe how computers store, manipulate, and transfer data types and files (e.g., integers, real numbers, Boolean Operators) in a binary system. ● 6-8.CT.c.3 – Create, modify, and use a database (e.g., define field formats, add new records, manipulate data), individually and collaboratively, to analyze data and propose solutions for a task/problem. ● 6-8.CT.c.4 – Perform a variety of operations such as sorting, filtering, and searching in a database to organize and display information in a variety of ways such as number formats (scientific notation and percentages), charts, tables, and graphs. ● 6-8.CT.c.5 – Select and use data-collection technology (e.g., probes, handheld devices, geographic mapping systems) to individually and collaboratively gather, view, organize, analyze, and report results for content-related problems. ● 6-8.CT.d – Programming and Development ● 6-8.CT.d.1 - Individually and collaboratively compare algorithms to solve a problem, based on a given criteria (e.g., time, resource, accessibility). ● 6-8.CT.d.2 - Use functions to hide the detail in a program. ● 6-8.CT.d.3 - Create a program, individually and collaboratively, that implements an algorithm to 	<ul style="list-style-type: none"> ● use logical reasoning to predict outputs given varying inputs. ● create a program, individually and collaboratively, that implements an algorithm to achieve a given goal. ● implement problem solutions using a programming language, including all of the following: looping behavior, conditional statements, expressions, variables, and functions. 	<p>to happen.</p> <ul style="list-style-type: none"> ● students can write computer code to solve a problem or demonstrate understanding. ● students can write efficient computer code which uses complex methods, such as looping behavior, conditional statements (if __, then __), expressions, variables, functions, etc. ● students can find, use, and interpret an appropriate computer simulation and respond to inquiries relating to it.
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<p>achieve a given goal.</p> <ul style="list-style-type: none"> ● 6-8.CT.d.4 - Implement problem solutions using a programming language, including all of the following: looping behavior, conditional statements, expressions, variables, and functions. ● 6-8.CT.d.5 - Trace programs step-by-step in order to predict their behavior. ● 6-8.CT.d.6 - Use an iterative approach to development and debugging to understand the dimensions of a problem clearly. ● 6-8.CT.e – Modeling and Simulation ● 6-8.CT.e.1 - Create a model of a real-world system and explain why some details, features and behaviors were required in the model and why some could be ignored. ● 6-8.CT.e.2 - Use and modify simulations to analyze and illustrate a concept in depth (e.g., light rays/mechanical waves interaction with materials, genetic variation). ● 6-8.CT.e.3 - Select and use computer simulations, individually and collaboratively, to gather, view, analyze, and report results for content-related problems (e.g., migration, trade, cellular function). 		
<p><i>Used in Content Area Standards</i></p>		<p><i>21st Century Skills</i></p>
<p>Not applicable</p>		<ul style="list-style-type: none"> ● Collaboration ● Communication ● Critical thinking ● Creativity.

Sources:

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