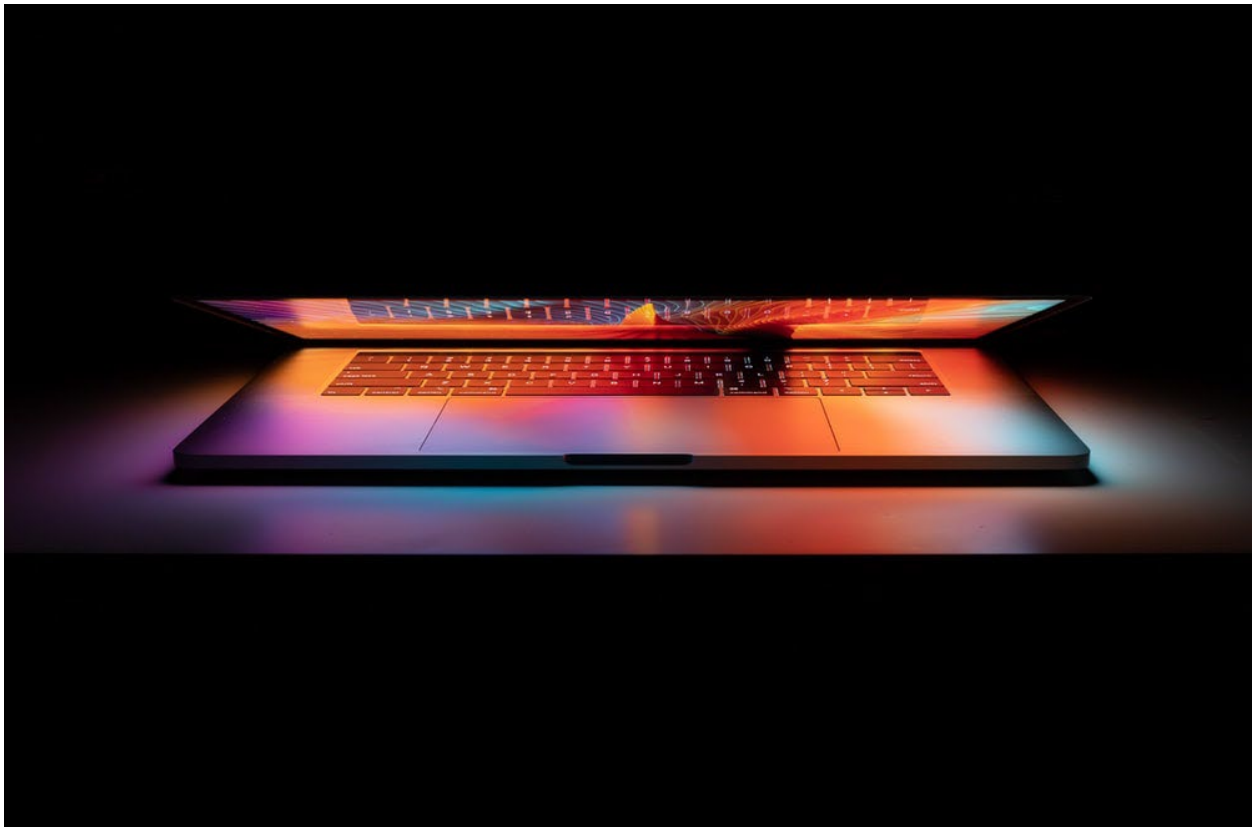


Computers and Technology Project Area Guide



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Welcome to the Computers and Technology Beginner Project Area Guide!

In this project, you will learn about hardware, computer graphics and visualization, software, information technology, accessibility and cybersecurity.

Activity 1: Computer Basics

Activity 2: History and Care of Computers

Activity 3: Computer Graphics and Visualization

Activity 4: Making Technology Work

Activity 5: Computers for All

Activity 6: Internet Safety Check

Activity 7: Staying Secure Online

Activity 8: That's Cryptic!

Computer Basics Activity 1

Project Outcomes:

- **Define information technology.**
- **Describe three uses for information technology in your day-to-day life.**
- **List secure and trustworthy search engines for your school projects.**
- **Identify the basic components of a computer: CPU, hard drive, memory, RAM, GPU and graphics card.**
- **Describe each of the major components and explain its role in a computer system.**

Computers and technology have been helping people for many years. Dating all the way back to the 1800s, the first computers utilized a punch card system. Today so many things have changed. Computers and technology are a huge asset to our homes, schools, communities and businesses. It's important to take precautions and safely use devices and the internet.

In the box below, describe what you think information technology is in your own words.

Use the resources below to update your definition of information technology. They will help you understand the advantages and disadvantages of information technology.

Throughout this project area guide, you'll see QR codes like these below. These will link you to a video, news article or website. With the permission of a parent or guardian, scan the image using the camera on a smart device or click the image.



Advantages to Information Technology	Why is this an advantage?

The World Wide Web went live on August 6, 1991. There is much correct and useful information on the internet, but we also know there is a great deal of incorrect information and opinion sites.

Utilizing secure and trustworthy search engines and websites is important when researching for schoolwork. Check out the QR codes to see search engines that are safe and secure for young people.



Try searching for a topic that interests you on each of the search engines, and then complete the chart below.

Search Engine Name	Why might this search engine be useful for young people?
Safe Search Kids	
Kidz Search	
Kidtopia	
Kiddle	
Which search engine did you like the most? Explain why.	

Computers have evolved so much over the years. From being as large as a room to being able to fit in the palm of your hand, the size and functions of computers and technology have drastically changed. Computers are put together using many components, hardware and software. Read more about some specific parts of computers and laptops below.

Major parts of computer/laptop

Monitor

The term monitor is often used synonymously with computer screen or display. The monitor displays the computer's user interface and open programs, allowing the user to interact with the computer, typically using the keyboard and mouse.

Webcam or Camera

The term webcam is a combination of web and video camera. The purpose of a webcam is, not surprisingly, to broadcast video on the web. Webcams are typically small cameras that either attach to a user's monitor or sit on a desk.

Keyboard

As the name implies, a keyboard is basically a board of keys. Along with the mouse, the keyboard is one of the primary input devices used with a computer. The keyboard's design comes from the original typewriter keyboards, which arranged letters and numbers in a way that prevented the type-bars from getting jammed when typing quickly.

Tower

The system unit, also known as a tower or chassis, contains the main components of a desktop computer. It includes the motherboard, CPU, RAM and other components. The case that houses these components is also part of the system unit.

Mouse

While most people don't want to see a mouse running around in their home, they typically don't have a problem with one sitting by their computer. This is because, along with the keyboard, the mouse is one of the primary input devices used with today's computers. The name comes from the small shape of the mouse, which you can move quickly back and forth on the mouse pad, and the cord, which represents the mouse's tail. Of course, if you are using a wireless mouse, the analogy does not work so well.

CD ROM

CD ROM stands for “Compact Disc Read-Only Memory.” A CD-ROM is a CD that can be read by a computer with an optical drive. The “ROM” part of the term means the data on the disc is “read-only,” or cannot be altered or erased. Because of this feature and their large capacity, CD-ROMs are a great media format for retail software. The first CD-ROMs could hold about 600 MB of data, but now they can hold up to 700 MB. CD-ROMs share the same technology as audio CDs, but they are formatted differently, allowing them to store many types of data.

USB Ports

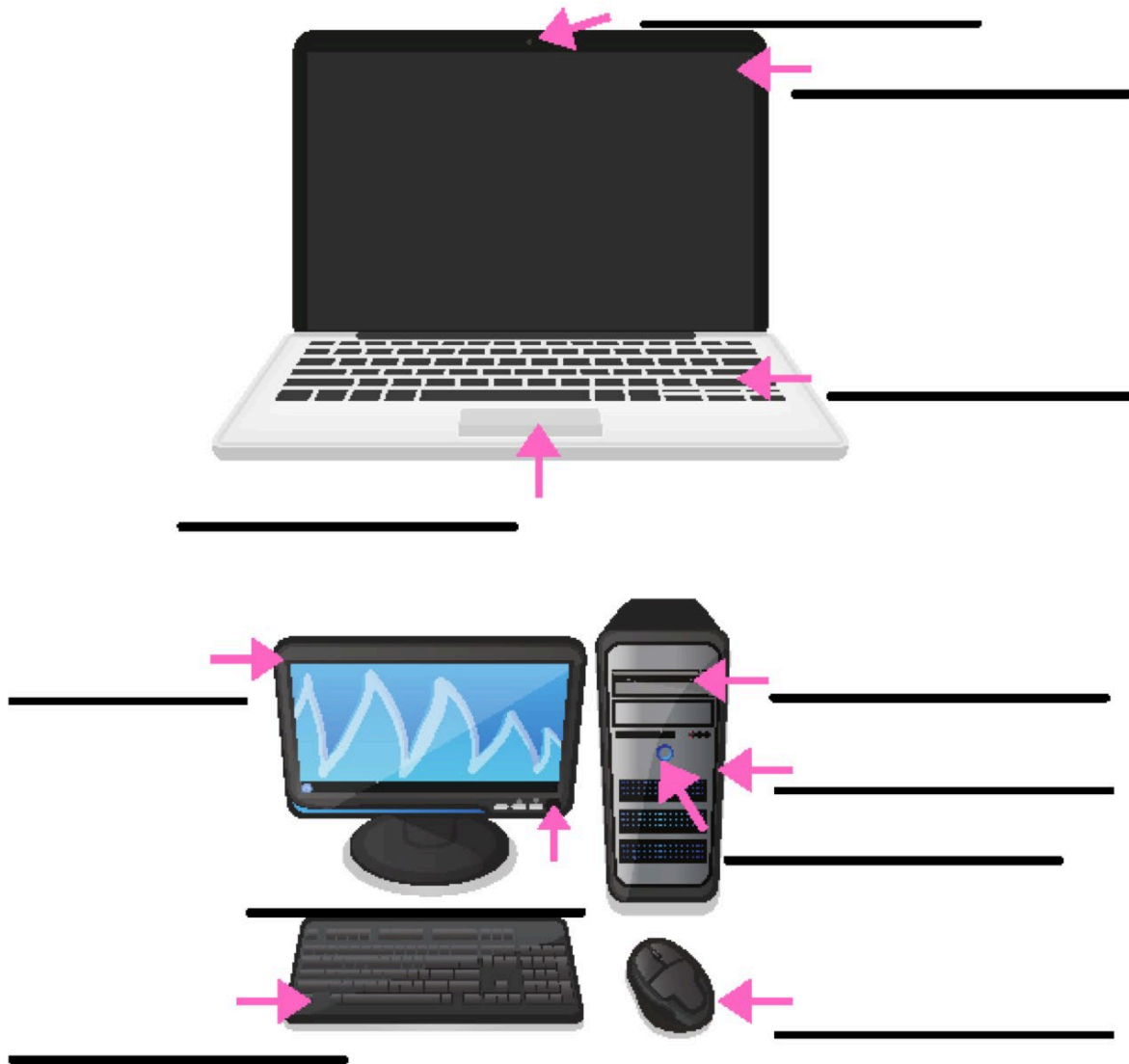
Stands for “Universal Serial Bus.” USB is the most common type of computer port used in today’s computers. It can be used to connect keyboards, mice, game controllers, printers, scanners, digital cameras and removable media drives, just to name a few. With the help of a few USB hubs, you can connect up to 127 peripherals to a single USB port and use them all at once (though that would require quite a bit of dexterity).

This QR code will take you to a list with all of the technical terms!



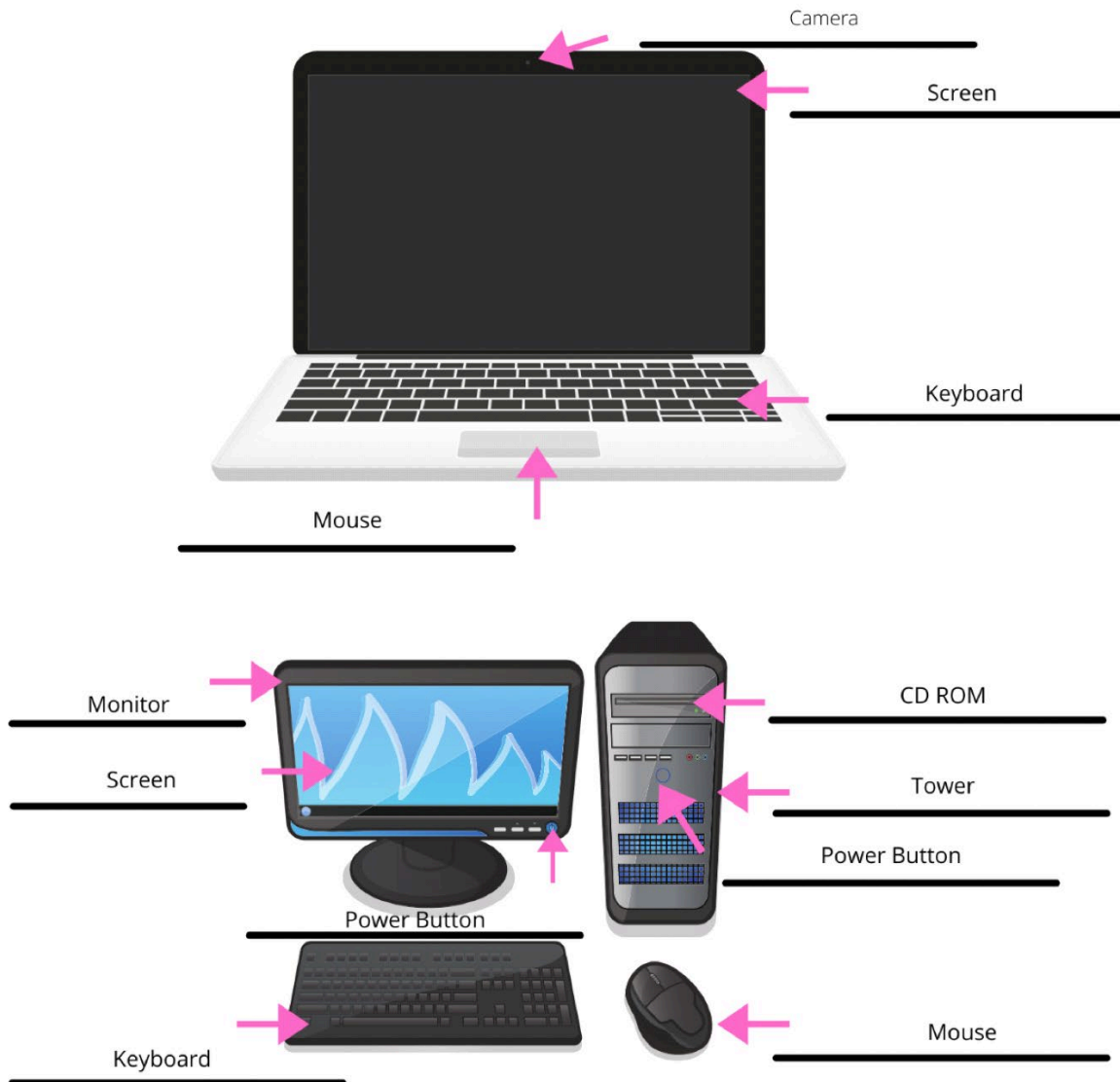
Test your knowledge below to label the laptop and desktop computer.

Label Sheet



Check your answers on the next page.

Label Sheet



History and Care of Computers Activity 2

Project Outcomes:

- Create a timeline of the history of computers, accessories and the internet.
- Research and demonstrate proper ways to clean technology devices.
- Identify how proper care can support a higher quality and longer life span of your device(s).

Computers and technology have advanced over the years, and they are continuously changing. Keeping up with updated software, apps and technology can be overwhelming. Check out these resources to learn more about how technology and computers have changed and improved over the years.



Using the word bank below, try guessing the year that some technology came out by placing each item on the timeline.

iPhone
TikTok
Apple Watch

Netflix Streaming
Nintendo Wii
Minecraft

Facebook
Blu-ray
PlayStation 3

2000

2005

2010

2015

2020

Check your answers on the next page.

Facebook – 2004

Blu-ray – 2006

PlayStation 3 – 2006

iPhone – 2007

Netflix Streaming – 2007

Minecraft – 2011

Nintendo Wii – 2012

Apple Watch – 2015

TikTok – 2016

Now, make your own timeline that explains the history of computers, accessories and the internet. Upload your timeline to your digital portfolio.

The cost of computers and devices can vary widely, but it is important to make sure we take care of our devices. Phones, tablets, smartwatches, TVs, ear buds and more all need to be cleaned and sanitized regularly. Millions of germs and dirt particles can be trapped on our devices. From makeup, sweat and dead skin cells, our devices house all the above. According to one study, the typical cellphone user touches his or her phone 2,617 times every day. Did you know ear wax builds up in your ear buds? Those need to be cleaned as well. Proper care can extend the life of your device.

Check out this video to learn more about cleaning and sanitizing.



This article is a great resource to check out to help extend the life expectancy of your devices.



Now that you have learned more about cleaning and sanitizing your devices and accessories, create a 60-second TikTok style video sharing how to clean a device or accessory you own. Once you are done, upload to your portfolio.

Computer Graphics and Visualization Activity 3

Project Outcomes:

- Define computer graphics, visualization, dimension, pixel, vector and raster graphics.
- Identify different graphic file types and their uses.
- Explore and understand the differences between 1D, 2D, 3D and 4D.

Graphics can be thought of as a drawing or painting, but in the real world we mess up a bunch of times and can go through several drafts prior to making the final product. With computer graphics, something can be drawn and changed a million times, without throwing away the beginning work. You can resize, change colors, flip, rotate, etc., without throwing it all away. Computer graphics are used widely to create new digital art, video games, cartoons, simulations and medical imaging.

Check out these resources to learn more about computer graphics, visualization and dimension.



Write a definition for each term:

Computer

Graphics

Visualization

Dimension


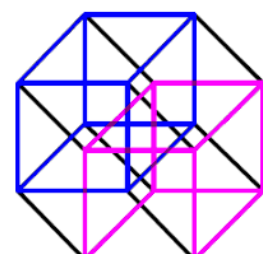


Now, you are going to learn the difference between 1D, 2D, 3D and 4D.

A dimension is a measurable extent of a physical quantity, such as length, breadth, depth or height.

Check out this resource to learn more about the different dimensions.



Now, can you tell the difference? Label each image as 1D, 2D, 3D or 4D.

<p>A.</p> 	<p>B.</p> 
<p>C.</p> 	<p>D.</p> 

Check your answers on the next page.

- A. 1D**
- B. 4D**
- C. 3D**
- D. 2D**

Scan the QR codes to learn about computer animation and how it is used in slideshow presentations like Google Slides.



Now it is your turn to explore different computer animation. Create a Google Slides, PowerPoint or Prezi presentation that uses animation and transitions. Once completed, upload it to your digital portfolio.

Making Technology Work Activity 4

Project Outcomes:

- Define software, application, mobile app and web app.
- List at least 10 different types of software and their uses.
- Utilize multiple applications to create documents, spreadsheets and presentations.
- Create an educational display that explains what a programming language is and its role in computing and software development.

Software is an important part of our devices. It allows our devices to become even more helpful to get everyday tasks done. Software is scattered throughout many working components of our smart devices. It allows our devices to perform specific tasks. There is system software, programming software and application software.

Check out these articles to learn more about software.



Now that you have read the articles, imagine that a friend asks you to explain software to them. Write a description for each item below as if you were telling it to a friend.

What is system software?

What is programming software?

What is application software?

Let's test your knowledge of software and hardware! Categorize each item below as either hardware or software.

Item	Hardware or Software
Microsoft Word	
Keyboard	
Photoshop	
Adobe Acrobat	
Central Processing Unit	
Mouse	
Minecraft	
Sound Card	
Google	

Check your answers on the next page.

Item	Hardware or Software
Microsoft Word	Software
Keyboard	Hardware
Photoshop	Software
Adobe Acrobat	Software
Central Processing Unit	Hardware
Mouse	Hardware
Minecraft	Software
Sound Card	Hardware
Google	Software

Next, let's learn about programming languages. Watch the videos to learn more.



Create an educational display that explains what a programming language is and its role in computing and software development. Share your display with your 4-H club members, and make sure you upload it to your digital portfolio.

Applications or apps are commonly used on all devices. Computers, tablets, phones, gaming systems, smart TVs, and even smart watches are all loaded with apps. Once opened, the app allows the user to perform specific tasks.

There are desktop apps and mobile apps. Desktop apps are loaded on desktop computers and laptops, while mobile apps are made specifically for tablets and phones.

Think about the apps you utilize daily, either desktop or mobile. What are your favorite apps to use for the following?

Learning: _____

Gaming: _____

Social: _____

School: _____

Common apps such as Microsoft Word, Publisher, PowerPoint, Excel, Prezi and Google Slides are often used while in school. These apps can help you write an essay, make a presentation or design a marketing flier for a school event. This project area is the perfect opportunity to showcase something you have created.

Think about a project you have recently completed using apps. Reflect on the project by answering these questions.

What project did you create?

What app did you use?

Why did you choose this app?

What tools did you utilize within the app?

Is there something that the app was lacking?

Upload a document, PDF or screenshot of the project to your portfolio. Make sure you save a copy of this project as you will need it for the next activity.

Computers for All Activity 5

Project Outcomes:

- Define accessibility as it relates to computers and technology.
- Explain why accessibility is important for documents, websites and applications.
- Explore color contrasts and research tools to test color contrasts.
- Describe why headings are important in documents and web accessibility.
- Understand what alt text is and why it assists visitors who are visually impaired in seeing images in documents and webpages.
- Research adaptive tools used by people with disabilities to view documents, websites and applications.
- Create an accessible document.

Accessibility is important to make technology use easier for people with disabilities. Common accessibility features are text to speech, increased font and cursor size, shortcuts and special assistive technology devices.

The Web Content Accessibility Guidelines, or WCAG, are guidelines developed specifically for improving web accessibility to make your content useful to all users. These are internationally recognized and adopted standards. Check out these resources to learn more about accessibility.



Apply what you have just learned about accessibility. Take your document in the last activity and make it more accessible. Upload this more accessible document to your portfolio.

Explain below what you did to make it more accessible.

Internet Safety Check Activity 6

Project Outcomes:

- **Define the following terms: cyberbullying, netiquette, virus protection, scam, scammers, hackers, phishing and cryptography.**
- **List appropriate online interactions. Review these with a trusted adult, parent or guardian.**
- **Research the risks of having a weak password and benefits of having a strong password.**
- **Create examples of a strong, weak and medium strength password key for others to utilize.**

The internet can be helpful in many ways, but being safe while surfing the web is very important. Information that is processed through websites can be used to steal your identity, scam you, hack into your computer or put a virus on your computer. Making sure that you visit only safe sites and have virus protection on your computer is important to keep threats down.

Online information can be kept safe by maintaining a secure login and password. It's beneficial to make sure that you take the time to create a strong, unique password and to change it often. Passwords and personal login information should not be shared.

Write definitions for the following terms:

Cyberbullying

Netiquette

Virus Protection

Scam

Scammers

Hackers

Check out these resources to learn more about staying safe online.



You have learned a lot about the internet and how important it is to be safe online. Complete this next activity to put your knowledge to the test!

Being safe online is important! While it is okay to share some information online, most information should be kept private.

Using the information box below, write whether each piece of personal information is safe to share or if it should be kept confidential on the next page.

- **My address is 123 Clover Lane.**
- **I like swimming.**
- **My favorite food is pizza.**
- **My birthday is February 28, 2008.**
- **My favorite music is rap.**
- **My social security number is 423-87-5968.**
- **My full name is Nicholas Greene.**
- **I have a pet dog.**
- **My mom works at Community Credit.**
- **My phone number is 629-7586.**
- **My name is Nick.**
- **Green is my favorite color.**
- **My password is Qwerty1.**

Safe to Share	Confidential

Check your answers on the next page. When you are finished, review your responses with a trusted adult.

Safe to Share	Confidential
<ul style="list-style-type: none"> • I like swimming. • My favorite food is pizza. • My favorite music is rap. • I have a pet dog. • My name is Nick. • Green is my favorite color. 	<ul style="list-style-type: none"> • My address is 123 Clover Lane. • My birthday is February 28, 2008. • My social security number is 423-87-5968. • My full name is Nicholas Greene. • My mom works at Community Credit. • My phone number is 629-7586. • My password is Qwerty1.

Another important part of staying safe online is having secure passwords. Scan the QR code to play the game Tower of Treasure. After you have learned about making strong passwords by playing the game, come up with your own weak, medium and strong passwords below.



Password Strength	Password Example
Weak	
Medium	
Strong	

Staying Secure Online Activity 7

Project Outcomes

- Describe computer virus, malware and spyware. Give examples of each.
- Create a list of information that should never be given out online.
- Compare and contrast different computer virus protection software.

Talk with your parent(s), guardian(s) or another trusted adult about your computer, internet activities and parental controls.

Using the questions below, interview an adult about internet safety, internet activities and parental controls. Record their responses.

What are three bits of information that are safe to share on the internet?

What are parental controls?

What are some good tips on creating passwords?

Have you ever gotten your information stolen from using online sites?

Do you use a virus protection program on your devices?

What should I do if I or someone I know is being cyberbullied?

Is public Wi-Fi safe?

Should I accept follow requests from people I do not know? Why or why not?

What are some characteristics of credible websites?

How do you know if the website you are visiting is secure?

That's Cryptic! Activity 8

Project Outcomes:

- **Research the history of cryptography including Morse code, Navajo Code Talkers and Enigma Machine.**
- **Describe the difference between codes and ciphers.**
- **Explain the difference between encryption and enciphering.**
- **Create an educational display that explains what a programming language is and its role in computing and software development.**

In today's world, large amounts of sensitive data are processed, stored and transmitted online. Information such as personal financial records, credit card numbers and passwords are constantly sought by hackers.

Cryptographic techniques are used to encrypt this information so that it would be very difficult for them to get the original data. One of the earliest forms of encryption and cipher was invented by Julius Caesar back in 60 B.C. This was a very simple method that was considered a 3-key system. For example, A would become D, B would become E and so forth. Today's data encryption is all computer based and relies heavily on large mathematical algorithms.

Check out these resources for learning more about the history of cryptography, codes and ciphers.



What is the difference between a code and a cipher? Explain below.

What is the difference between encryption and enciphering? Explain below.

Using Morse Code, what are the words below?

A .-	J .---	S ...
B -...	K -.-	T -
C -.-.	L .-..	U ..-
D -..	M --	V ...-
E .	N -.	W .--
F ..-	O ---	X -.-.
G --.	P .--.	Y -.-.
H	Q --.-	Z --..
I ..	R .-	

..- . . - . . - . - . - . - . -

.... . - . - . - . - . - . -

-.- . -.- . - . - . - . - . - . - . -

Now that you have used Morse Code, check out Caesar's cipher and see if you can decipher the examples.

**A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
D E F G H I J K L M N O P Q R S T U V W X Y Z A B C**

R Q O L Q H

F R P S X W H U

F R G L Q J

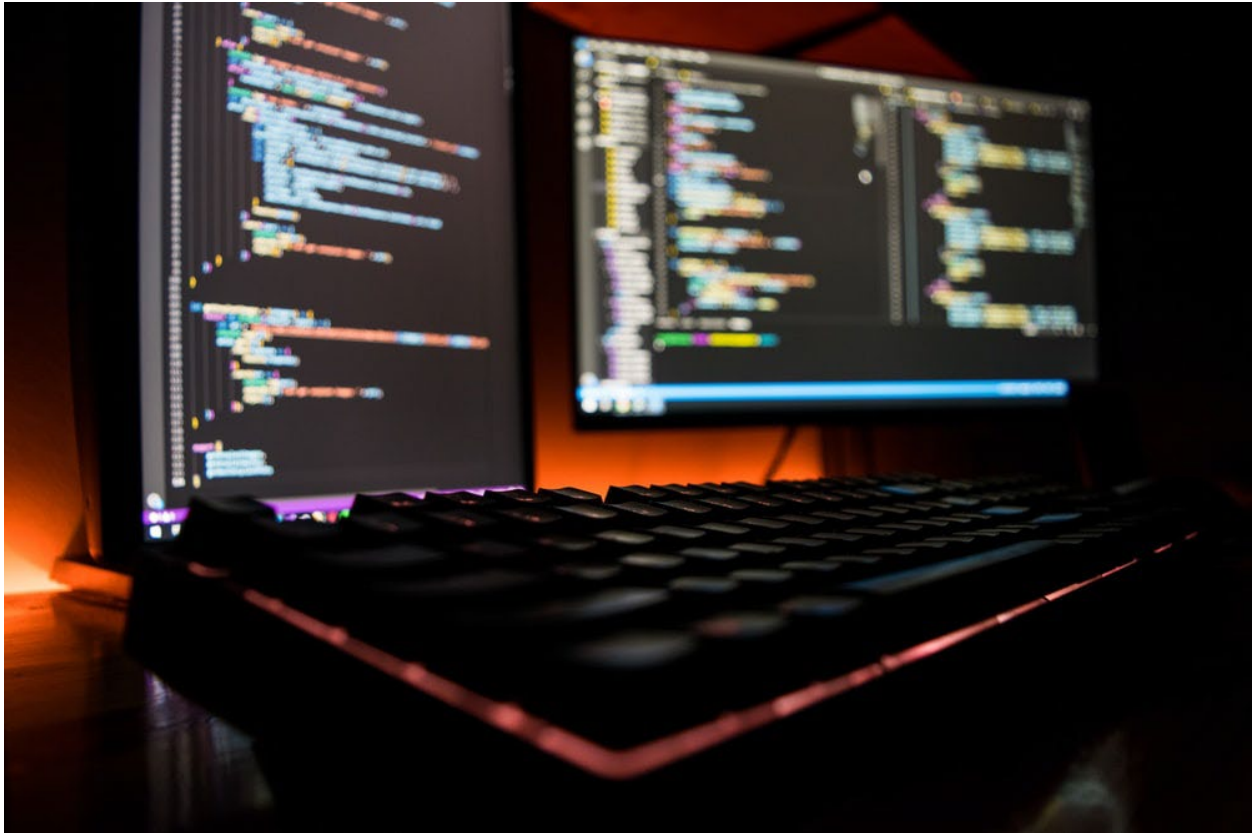
Now that you have seen these examples, create your own cipher and key to make your own message. Upload this activity to your portfolio. Check your answers on the next page.

Morse Code Key

1. Firewall
2. Hacker
3. Cyberspace

Caesar's Cipher Key

1. Online
2. Computer
3. Coding



Congratulations!

You have completed the **Computers and Technology Beginner Project Area Guide**. You are now ready to learn more about your favorite computers and technology topics and share your knowledge with others. As you create new projects, continue uploading them to your digital portfolio.



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