Computers

Grade 4

Prepared by:

David Hershberger

Superintendent of Schools:

Marie C. Cirasella, Ed.D.

Approved by the Midland Park Board of Education on

August 23, 2022

Born on **August 22, 2022**

Grade 4 Computers

Course Description: Grade 4 Computers will continue to build off the skills and knowledge the students have attained in Grades 1-3. Keyboarding skills continue to be a central focus and additional keys and shortcuts will be introduced this year. Google Docs, as well as Google Slides skills will be enhanced through more advanced features when creating class projects. Understanding the history of computers and how they have changed the world is an important topic for students. Students will see how quickly technology changes and how people are continually pushing the limits. Internet safety and digital citizenship will always be a key component to our program due to the increased role of the Internet, smartphones and social media in our daily lives.

Course Sequence:

Unit 1: Keyboarding, Computer History and Impacts on Society and Google Education Suite   (12 weeks) *
Unit 2: Keyboarding, Internet Safety, Digital Citizenship, (14 weeks)
Unit 3: Keyboarding, Coding, Slides (14 Weeks) *

Pre-requisite: Grade 3 Computers

Approximately 2 weeks will be spent on on-line practice assessments preparing for NJSLA

Unit 1 - Overview

Content Area: Computers
Unit Title: Computer History and Impacts on Society
Grade Level: 4
Core Ideas: Improving keyboarding skills benefits students across all levels and subjects. Computer history is important to understand as it is the foundation upon which current innovations were built. This leads to current technologies and how they have impacted the world over time. It also leads to realizations that technology is rapidly changing and progressing.

Unit 1 - Standards

Standards: (Content and Technology)**:**

CPI#:	Statement:
Performance Expectations (NJSLS)	
Career Readiness, Life Literacies, and Key Skills	
9.2.5.CAP.1	Evaluate personal likes and dislikes and identify careers that might be suited to personal likes.
9.2.5.CAP.2	Identify how you might like to earn an income.
9.4.5.CT.3	Describe how digital tools and technology may be used to solve problems.
9.2.5.CAP.1	Evaluate personal likes and dislikes and identify careers that might be suited to personal likes.
9.4.5.TL.1	Compare the common uses of at least two different digital tools and identify the advantages and disadvantages of using each.
9.4.5.CI.4	Research the development process of a product and identify the role of failure as a part of the creative process
9.4.5.DC.8	Propose ways local and global communities can engage digitally to participate in and promote climate action
Computer Science and Design Thinking	
8.1.5.CS.1	Model how computing devices connect to other components to form a system.
8.1.5.CS.2	Model how computer software and hardware work together as a system to accomplish tasks.
8.1.5.CS.3	Identify potential solutions for simple hardware and software problems using common troubleshooting strategies.
8.2.5.ED.4	Explain factors that influence the development and function of products and systems (e.g., resources, criteria, desired features, constraints).
8.2.5.ED.5	Describe how specifications and limitations impact the engineering design process.
8.2.5.ITH.1	Explain how societal needs and wants influence the development and function of a product and a system.
8.2.5.ITH.2	Evaluate how well a new tool has met its intended purpose and identify any shortcomings it might have.
8.2.5.ITH.3	Analyze the effectiveness of a new product or system and identify the positive and/or negative consequences resulting from its use.
8.2.5.ITH.4	Describe a technology/tool that has made the way people live easier or has led to a new business or career.
8.2.5.NT.2	Identify new technologies resulting from the demands, values, and interests of individuals, businesses, industries, and societies.
8.2.5.NT.4	Identify how improvement in the understanding of materials science impacts technologies.
8.2.5.ETW.1	Describe how resources such as material, energy, information, time, tools, people, and capital are used in products or systems.
8.2.5.ETW.2	Describe ways that various technologies are used to reduce improper use of resources.
8.2.5.ETW.3	Explain why human-designed systems, products, and environments need to be constantly monitored, maintained, and improved.
8.2.5.ETW.4	Explain the impact that resources, such as energy and materials used to develop technology, have on the environment.
8.2.5.ETW.5	Identify the impact of a specific technology on the environment and determine what can be done to increase positive effects and to reduce any negative effects, such as climate change.
8.2.5.EC.1	Analyze how technology has contributed to or reduced inequities in local and global communities and determine its short- and long-term effects.

Interdisciplinary Connection	
1.2.5.Cr1c:	Connect media artwork to personal experiences and the work of others.
1.2.5.Cr3a:	Construct and arrange various content into unified and expressive media arts productions.
1.2.5.Cr3c:	Explore how elements and components can be altered for clear communication and intentional effects, point of view, perspective, and refine media artworks to improve clarity and purpose.
NJSLSA.R1.	Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
NJSLSA.R7.	Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.
NJSLSA.W6.	Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.
NJSLSA.W9.	Draw evidence from literary or informational texts to support analysis, reflection, and research.

Intercultural Statements (*Amistad, Holocaust, LGBT, SEL, etc...*)

Amistad: Highlight the contributions of people such as Granville T. Woods, Marian R. Croak and Mark Dean to the progress of computer science.

AAPI: Contributions of Asian Americans to computer science such as Steven Shih Chen of YouTube and Dr. Ching Wan Tang who helped create OLED screen technology.

Unit Essential Question(s):	Unit Enduring Understandings:
• How can increased keyboarding efficiency save us time in our lives? • Who are some key innovators in computer history? • What are some technologies that have changed our society? • How can we use technology to help reduce impacts of climate change?	• Using the home row enables us to type more efficiently • Understanding computer history helps to see the rapid progression of innovation • Many people from all backgrounds have made important contributions to the field of computer science • Computers and Technology have many impacts not only on our society, but also on our planet •

Evidence of Learning

Formative Assessments: BrainPop assignments
Ed Club Typing Progress
Computer History Timeline
Teacher Observations

Summative/Benchmark Assessment(s):
Computer History Quiz
Keyboarding Assessments

Alternative Assessments:
Student conversations
Student project

Resources/Materials:	Key Vocabulary:	
BrainPop EdClub Typing Google Education Suite Google Classroom Faronics Insight	Abacus Binary Ada Lovelace Grace Hopper Mark Dean Steven Shih Chen	Charles Babbage Alan Turing Steve Jobs Bill Gates Granville Woods Mark Zuckerberg

Suggested Pacing Guide

Lesson Name/Topic	Student Learning Objective(s)	Suggested Tasks/Activities:	Day(s) to Complete
Introduction to Computer History	- Learn names of important pioneers	-Watch video showing timeline of computer history	2

	- General idea of when specific technologies were invented	-Review key pioneers and what they contributed to computer science -Discuss more recent innovations and how they impact everyday life -Use Docs to list technology students use daily	
Brain Pop	-See the progress of technology from ancient times to present day	-Watch "Computer History", "Ada Lovelace", and "Grace Hopper" videos -Individually complete BrainPop assignments	3
Keyboarding	-Use home row and proper keyboarding technique	-Review of typing accounts -Home Row Review -Keyboarding Practice 2-3x per month	3
Google Docs and Drawings	-Formatting -Adding Images	-Bulleted or numbered lists of technology used daily -Have students create a shared Doc to make timeline of specific timeframe with partner -Change layout to Landscape -Summer Collage w/ images and WordArt	4

Teacher Notes:
Additional Resources: YouTube K-5Tech.Net

Differentiation/Modification Strategies

Students with Disabilities/504
● Preferential Seating
● Strategic/flexible grouping and pairing
● Ample wait time before calling on students
● Student self-assessment, self-monitoring of progress
● Speaking: Provide sentence starters, processing time, cues and prompts, embedded choices, practice time; repeating/ simplifying of directions; clear visual, verbal and demonstrative modeling; think/Pair/Share
● Have students set personal growth goals
● Groups/Pairs: teach rules and expectations; skills of independence – bridging phrases, disagreeing agreeably, voice level; strategies for moving in and out of groups; signal for getting teacher's attention
● Allow: flexible grouping; adequate/extra time; assign group roles; ample use of visuals; kinesthetic activities; rhythm, music, body movements; teach vocab in context, and in small chunks; break down assignments into manageable parts/tasks
● Reading: Use peer tutoring; label main ideas; label 5 W's; visual imagery; graphic organizers
● Allow: Highlighting of key words/concepts; silent pre-reading; partner reading
● Teach: Pre-reading strategies; 'During' reading strategies; Post-reading strategies; Use of manipulatives; Use of graphic organizers; Frequent repetition; Learning centers or stations that address varied activities, skills, learning modalities
● Writing: Shorten task; Require lists rather than sentences. Allow: note-taking; visual representation of ideas; collaborative writing; Brainstorm word bank; Pre-writing with graphic organizers. Provide: Model of writing; Structure for writing; Fill-in-blank form for note-taking

English Language Learners
● Give instructions/directions in writing and orally
● Assign a buddy, same language or English speaking
● Allow errors in speaking
● Allow errors in writing
● Highlight key vocabulary
● Reduce amount of work required
● Rephrase questions, directions, and explanations
● Allow extended time to answer questions, and permit drawing, as an explanation

Gifted and Talented
● Anchor Activities
● Appoint as teacher's helpers

● Assign additional Internet activities

Students at Risk

● Online Enrichment activities
● Peer tutoring

Unit 2 - Overview

Content Area: Computers

Unit Title: Digital Citizenship

Grade Level: 4

Core Ideas: Being a responsible and ethical digital citizen is crucial for our 21st century learners. Students will learn to protect their information, be responsible online, and stand up for others. Students will understand what we share now can affect our future, and that cyberbullying has serious consequences. Lessons on ethical use of sources and copyrighted images will also be taught.

Unit 2 - Standards

Standards: (Content and Technology)**:**

CPI#:	Statement:
Performance Expectations (NJSLS)	
Career Readiness, Life Literacies, and Key Skills	
9.2.5.CAP.1	Evaluate personal likes and dislikes and identify careers that might be suited to personal likes.
9.4.5.CT.3	Describe how digital tools and technology may be used to solve problems.
9.4.5.DC.3	Distinguish between digital images that can be reused freely and those that have copyright restrictions.
9.4.5.DC.4	Model safe, legal, and ethical behavior when using online or offline technology
9.4.5.DC.5	Identify the characteristics of a positive and negative online identity and the lasting implications of online activity.
9.4.5.DC.6	Compare and contrast how digital tools have changed social interactions
9.4.5.DC.7	Explain how posting and commenting in social spaces can have positive or negative consequences.
9.4.5.IML.1	Evaluate digital sources for accuracy, perspective, credibility and relevance
9.4.5.TL.3	Format a document using a word processing application to enhance text, change page formatting, and include appropriate images, graphics, or symbols.
Technology Literacy (9.4)/ Computer Science and Design Thinking	
8.1.5.NI.2	Describe physical and digital security measures for protecting sensitive personal information.
8.1.5.IC.1	Identify computing technologies that have impacted how individuals live and work and describe the factors that influenced the changes.
8.1.5.IC.2	Identify possible ways to improve the accessibility and usability of computing technologies to address the diverse needs and wants of users.
8.1.5.DA.1	Collect, organize, and display data in order to highlight relationships or support a claim.
Interdisciplinary Connection (*must include Companion Standard(s) R and W)*	
RI.4.1.	Refer to details and examples in a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text.
RI.4.2.	Determine the main idea of a text and explain how it is supported by key details; summarize the text.
RI.4.4.	Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.
W.4.6.	With some guidance and support from adults, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of one page in a single sitting.
W.4.7.	Conduct short research projects that build knowledge through investigation of different aspects of a topic.
Intercultural Statements (*Amistad, Holocaust, LGBT, SEL, etc...)*	

Holocaust: Students will discuss and understand impact of cyberbullying and its potential consequences. They will learn to stand up for others (Upstander) and what to do if they are a victim.

Unit Essential Question(s):	Unit Enduring Understandings:
• What is cyberbullying and what do we do if we see it happening?	• Technology allows us to connect with others in meaningful ways • It is important to keep our information and identities private while online.

• How can what we do and say online now affect our future? • What are some ways to ensure that we keep our data private? • How can our online words affect others and their mental health?	• How to keep our computers free from Malware and safe from hackers • People often lie about their real identity so you should not talk to strangers online • What you post online can live on forever • There can be real world consequences to poor online behavior

Evidence of Learning

Formative Assessments: BrainPop assignments
Common Sense Media assignments
Individual Slideshow

Summative/Benchmark Assessment(s):
Online Safety and Vocabulary Quiz

Alternative Assessments:
Student conversations
Student choice of project

| **Resources/Materials:**
BrainPop
Common Sense Media
Google Be Internet Awesome
Code.Org
Google Docs
Google Classroom
Faronics Insight | **Key Vocabulary:**
Cyberbully   Spam
Social Media   Hacker
Downloading   Malware
Hyperlink   Phishing
Digital Etiquette   Social Network
Bystander   Upstander |

Suggested Pacing Guide

Lesson Name/Topic	Student Learning Objective(s)	Suggested Tasks/Activities:	Day(s) to Complete
Digital Citizenship Intro	-Understand what Digital Citizenship is -Review prior knowledge -	-Class Discussion -Watch Videos together as a class	1
Vocabulary	-Discuss what students have experienced online -Comprehend vocabulary terms	-Class Discussion -Review Key Vocabulary Watch related videos	1
BrainPop	-How to stay safe online	-BrainPop "Online Safety" and "Cyberbullying" videos -Brain Pop activities	2
Common Sense Media	-Digital Drama -Cyberbullying -Media Balance	-Common Sense Media grade 4 lessons -Watch related videos as a class -Complete worksheets individually and in small groups	4
Digital Passport	-How to respond to cyberbullying -Using keywords and finding appropriate sources	Digital Passport E-Volve and Search Shark Games	3
Google Interland	-Share with Care -Don't Fall for Fake	-Google Be Internet Awesome -Slideshow from https://beinternetawesome.withgoogle.com/en_us/slides -Play Interland	3

Teacher Notes:
Additional Resources: YouTube K-5Tech.Net

Differentiation/Modification Strategies

Students with Disabilities/504
- Preferential Seating
- Strategic/flexible grouping and pairing
- Ample wait time before calling on students
- Student self-assessment, self-monitoring of progress
- Speaking: Provide sentence starters, processing time, cues and prompts, embedded choices, practice time; repeating/ simplifying of directions; clear visual, verbal and demonstrative modeling; think/Pair/Share
- Have students set personal growth goals
- Groups/Pairs: teach rules and expectations; skills of independence – bridging phrases, disagreeing agreeably, voice level; strategies for moving in and out of groups; signal for getting teacher's attention
- Allow: flexible grouping; adequate/extra time; assign group roles; ample use of visuals; kinesthetic activities; rhythm, music, body movements; teach vocab in context, and in small chunks; break down assignments into manageable parts/tasks
- Reading: Use peer tutoring; label main ideas; label 5 W's; visual imagery; graphic organizers
- Allow: Highlighting of key words/concepts; silent pre-reading; partner reading
- Teach: Pre-reading strategies; 'During' reading strategies; Post-reading strategies; Use of manipulatives; Use of graphic organizers; Frequent repetition; Learning centers or stations that address varied activities, skills, learning modalities
- Writing: Shorten task; Require lists rather than sentences. Allow: note-taking; visual representation of ideas; collaborative writing; Brainstorm word bank; Pre-writing with graphic organizers. Provide: Model of writing; Structure for writing; Fill-in-blank form for note-taking

  English Language Learners
- Give instructions/directions in writing and orally
- Assign a buddy, same language or English speaking
- Allow errors in speaking
- Allow errors in writing
- Highlight key vocabulary
- Reduce amount of work required
- Rephrase questions, directions, and explanations
- Allow extended time to answer questions, and permit drawing, as an explanation

Gifted and Talented
- Anchor Activities
- Appoint as teacher's helpers
- Assign additional Internet activities

Students at Risk
- Online Enrichment activities
- Peer tutoring

Unit 3 - Overview	
Content Area: Computers	
Unit Title: Coding	
Grade Level: 4	
Core Ideas: Coding is a skill that is becoming more and more useful in today's world. It also furthers students' abilities in problem solving, critical thinking, teamwork, logic and perseverance. There are a variety of ways to teach coding and different types of coding which makes it accessible to a wide variety of learners. Programming allows you to create new apps, games, websites, art and other computer based artifacts.	
Unit 3 - Standards	
Standards: (Content and Technology)**:**	
CPI#:	**Statement:**
Performance Expectations (NJSLS)	
Career Readiness, Life Literacies, and Key Skills	
9.2.5.CAP.3	Identify qualifications needed to pursue traditional and non-traditional careers and occupations.
9.2.5.CAP.4	Explain the reasons why some jobs and careers require specific training, skills, and certification (e.g., life guards, child care, medicine, education) and examples of these requirements.
9.4.5.CT.1	Identify and gather relevant data that will aid in the problem-solving process
9.4.5.CT.3	Describe how digital tools and technology may be used to solve problems.
9.4.5.TL.5	Collaborate digitally to produce an artifact
Technology Literacy (9.4)/ Computer Science and Design Thinking	
8.1.5.IC.1	Identify computing technologies that have impacted how individuals live and work and describe the factors that influenced the changes.
8.1.5.IC.2	Identify possible ways to improve the accessibility and usability of computing technologies to address the diverse needs and wants of users.
8.1.5.AP.1	Compare and refine multiple algorithms for the same task and determine which is the most appropriate.
8.1.5.AP.2	Create programs that use clearly named variables to store and modify data.
8.1.5.AP.3	Create programs that include sequences, events, loops, and conditionals.
8.1.5.AP.4	Break down problems into smaller, manageable sub-problems to facilitate program development.
8.1.5.AP.5	Modify, remix, or incorporate pieces of existing programs into one's own work to add additional features or create a new program.
8.1.5.AP.6	Develop programs using an iterative process, implement the program design, and test the program to ensure it works as intended.
8.2.5.ED.3	Follow step by step directions to assemble a product or solve a problem, using appropriate tools to accomplish the task.
8.2.5.ED.6	Evaluate and test alternative solutions to a problem using the constraints and trade-offs identified in the design process.
8.2.5.ITH.1	Explain how societal needs and wants influence the development and function of a product and a system.
8.2.5.ITH.2	Evaluate how well a new tool has met its intended purpose and identify any shortcomings it might have.
8.2.5.ITH.3	Analyze the effectiveness of a new product or system and identify the positive and/or negative consequences resulting from its use
8.2.5.ITH.4	Describe a technology/tool that has made the way people live easier or has led to a new business or career.
8.2.5.NT.1	Troubleshoot a product that has stopped working and brainstorm ideas to correct the problem.
8.2.5.NT.4	Identify how improvement in the understanding of materials science impacts technologies.
8.2.5.ETW.2	Describe ways that various technologies are used to reduce improper use of resources.
8.2.5.ETW.4	Explain the impact that resources, such as energy and materials used to develop technology, have on the environment.
8.2.5.EC.1	Analyze how technology has contributed to or reduced inequities in local and global communities and determine its short- and long-term effects.
Interdisciplinary Connection (*must include Companion Standard(s) R and W*)	

RI.4.3.	Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.
RI.4.4.	Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.
W.4.6.	With some guidance and support from adults, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of one page in a single sitting
SL.4.1.	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly

Intercultural Statements (*Amistad, Holocaust, LGBT, SEL, etc...*)

Amistad: Watch the video "Change the Face of Computer Science" from Code.org and discuss. This video focuses on the under representation of minorities in computer science.

Unit Essential Question(s):	Unit Enduring Understandings:
• How do we use algorithms in our everyday lives? • Can we use loops to make our programs easier to write? • How does computer programming impact our world?	• We communicate with computers, applications, and software programs through computer programming • There are a wide variety of ways for coding to be used • Algorithm is a set of directions used to solve problems or perform tasks • Perseverance, critical thinking, problem solving and teamwork are some important skills learned through coding

Evidence of Learning

Formative Assessments: BrainPop assignments
Code.org Lesson Work
Class projects with Google CS First

Summative/Benchmark Assessment(s):
Vocabulary Quiz

Alternative Assessments:
Student conversations
Student project

Resources/Materials:	**Key Vocabulary:**
BrainPop Code.Org Google CS First Flocabulary Google Classroom Faronics Insight	Coding Program Algorithm Loop Sequence Debugging Binary

Suggested Pacing Guide			
Lesson Name/Topic	**Student Learning Objective(s)**	**Suggested Tasks/Activities:**	**Day(s) to Complete**
BrainPop	-Understand how binary code works	-Watch Binary video as a class -Complete activities that go along with the video	1
Unplugged Code.org	-Be able to write name in Binary Code	-Watch Binary coding video together -Complete Course 2 level 14 "Binary Bracelets"	1
Code.Org	-Use block coding to complete puzzles -Problem solve a variety of coding puzzles -Work with a partner to solve complex problems	-Work through the assigned levels of Code.Org Course D -Create art using Code -Debug a program with errors -Unplugged Code.org lessons as a class	8
Flocabulary	-Understand what Coding is and what it can do	-Flocabulary Coding and Loops lessons -Watch video as a class and discuss	2

	-Understand how to use Loops in an algortithm	-Students independently	
Google CS First	-Animate a Name	-Follow along with video tutorials in "Animate a Name" -Use Scratch platform to write name and animate each letter	2

Teacher Notes:

Additional Resources:
YouTube
K-5Tech.Net
https://youtu.be/uhcA6K8rWp0 "Change the Face of Computer Science"

Differentiation/Modification Strategies

Students with Disabilities/504
- Preferential Seating
- Strategic/flexible grouping and pairing
- Ample wait time before calling on students
- Student self-assessment, self-monitoring of progress
- Speaking: Provide sentence starters, processing time, cues and prompts, embedded choices, practice time; repeating/ simplifying of directions; clear visual, verbal and demonstrative modeling; think/Pair/Share
- Have students set personal growth goals
- Groups/Pairs: teach rules and expectations; skills of independence – bridging phrases, disagreeing agreeably, voice level; strategies for moving in and out of groups; signal for getting teacher's attention
- Allow: flexible grouping; adequate/extra time; assign group roles; ample use of visuals; kinesthetic activities; rhythm, music, body movements; teach vocab in context, and in small chunks; break down assignments into manageable parts/tasks
- Reading: Use peer tutoring; label main ideas; label 5 W's; visual imagery; graphic organizers
- Allow: Highlighting of key words/concepts; silent pre-reading; partner reading
- Teach: Pre-reading strategies; 'During' reading strategies; Post-reading strategies; Use of manipulatives; Use of graphic organizers; Frequent repetition; Learning centers or stations that address varied activities, skills, learning modalities
- Writing: Shorten task; Require lists rather than sentences. Allow: note-taking; visual representation of ideas; collaborative writing; Brainstorm word bank; Pre-writing with graphic organizers. Provide: Model of writing; Structure for writing; Fill-in-blank form for note-taking

English Language Learners
- Give instructions/directions in writing and orally
- Assign a buddy, same language or English speaking
- Allow errors in speaking
- Allow errors in writing
- Highlight key vocabulary
- Reduce amount of work required
- Rephrase questions, directions, and explanations
- Allow extended time to answer questions, and permit drawing, as an explanation

Gifted and Talented
- Anchor Activities
- Appoint as teacher's helpers
- Assign additional Internet activities

Students at Risk
- Online Enrichment activities
- Peer tutoring