Grade level: 4th Grade

Course Title: STEM

Topic/Concept: Google Classrom (Class Stream)

Time Allotment: 2 classes

Unit Sequence: 1

Major Concepts to be learned:

- The students will review how to open the Internet Browser a variety of ways
- Log into their private Google Account
- Navigate the class stream to locate weekly assignments

Expected Skills to be demonstrated:

- Opening the Internet using one of the three methods (Shortcut, Start Menu, or Icon)
- Log in to Google Classroom with the assistance of a log in card
- Using the mouse and keyboard appropriately to navigate the classstream and open assignments

PA Standards/Anchors:

CSTA Standards -
1A-NI-014
1A-DA-05
1A-IC-17
1A-IC-18

Eligible Content:

- Work respectfully and responsibly with others online.
- Keep login information private, and log off of devices appropriately.
- Explain what passwords are and why we use them, and use strong passwords to protect devices and information from unauthorized access.
- Store, copy, search, retrieve, modify, and delete information using a computing device and define the information stored as data.

Instructional Strategies:

Teacher Demonstration on the Smartboard
Teacher Discussion
Guided Student Practice on Computers
Independent Student Practice on Computers

Assessments:

- Teacher Observation
- Teacher Assessment with Rubric

Grade level: 4th Grade | **Course Title: STEM** | **Topic/Concept: Internet Skills**

Time Allotment: 1 class | **Unit Sequence: 2**

Major Concepts to be learned:

- The students will learn how to open the Internet Browser a variety of ways
- Choose a "bookmarked" Website
- Navigate through age-appropriate websites
- Close out of an internet window

Expected Skills to be demonstrated:

- Opening the Internet using one of the three methods (Shortcut, Start Menu, or Icon)
- Choosing the appropriate website from the list of favorite websites
- Using the mouse appropriatly to navigate through a website by clicking on links
- Close out of internet window

PA Standards/Anchors:

CSTA Standards -
1B-CS-01
1B- CS-02
1B-NI-05

Eligible Content:

- Discuss real-world cybersecurity problems and how personal information can be protected.
- Model how computer hardware and software work together as a system to accomplish tasks.
- Describe how internal and external parts of computing devices function to form a system.

Instructional Strategies:

Teacher Demonstration on the Smartboard
Student Interaction Using Smartboard
Teacher Discussion
Guided Student Practice on Computers
Independent Student Practice on Computers

Assessments:

- Teacher Observation
- Teacher Assessment with Rubric

Grade level: 4th Grade | **Course Title: STEM** | **Topic/Concept: Keyboard/Typing.com**

Time Allotment: All Year | **Unit Sequence: 3**

Major Concepts to be learned:

- Recognize the functions of the letter and number keys on the keyboard
- The function of the enter, backspace, shift (capital letters and symbols), space bar, and caps lock key
- Learn about proper finger placement and practice proper keyboarding finger position

Expected Skills to be demonstrated:

- Knowledge of each key and it's function
- Proper use of "special" keys in various Word Processing (Google Docs) activities
- Knowledge of where each key is located on the keyboard and use of the right fingers to type them

PA Standards/Anchors:	Eligible Content
CSTA Standards - 1B-CS-01	• Students describe how internal and external parts of computing devices function to form a system. Using a keyboard builds a student's understanding of how human input translates into a digital system

Instructional Strategies:	Assessments:
Introduce each part of the computer using the following methods: • Website • SMARTboard presentation • Hands-on manipulation with each part of the computer	• Observing Classroom Computer Use • Typing.com data and reports • Teacher Observation

Grade level: 4th Grade | **Course Title: STEM** | **Topic/Concept: Google Docs**

Time Allotment: 2 classes | **Unit Sequence: 4**

Major Concepts to be learned:

- How to use a Word Processing Program to type words and sentences.
- Identify and use all of the buttons on the Google Docs toolbar to format the font
- How to use a Word Processing Program to add images and drawings
- How to Edit the images using the editing images toolbar

Expected Skills to be demonstrated:

- Ability to type in Google Docs
- Ability to format font using all of the buttons on the Google Docs Toolbar
- Ability to add multiple images and them around a page that includes text into a Google Document
- Ability to create a drawing using the Google Drawing feature and all of the tools (shapes, lines, text box, images)
- Ability to edit an images by cropping and recoloring the image

PA Standards/Anchors:

CSTA Standards -
1B-IC-18
1A-DA-05
1A-DA-06

Eligible Content:

- Select and operate appropriate software to perform a variety of tasks, and recognize that users have different needs and preferences for the technology they use.
- Store, copy, search, retrieve, modify, and delete information using a computing device and define the information stored as data.
- Collect and present the same data in various visual formats.
- Brainstorm, discuss, and evaluate how computing technologies influence cultural practices and global economies

Instructional Strategies:

Teacher Demonstration on the Smartboard
Student Interaction Using Smartboard
Guided Student Practice on Computers

Assessments

- Computer Based Project
- Teacher Observation

Grade level: 4th Grade **Course Title: STEM** **Topic/Concept: Email**

Time Allotment: 4 classes **Unit Sequence: 4**

Major Concepts to be learned:

- How to open an and log into email account
- How to open and delete email messages
- How to send an email message to a single person and to a group of people
- How to read and reply to a messgae using the reply or reply all options
- Email ettiqute and proper message format
- How to send an attachment over email

Expected Skills to be demonstrated:

- Ability to log into email account
- Abilty to send emails to individuals and groups
- Abiity to read and reply to emails that were sent by an individual and a group
- Ability to send an attachment over email that was saved on the computer

PA Standards/Anchors:

CSTA Standards -
1B-CS-03
1B-NI-04
1B-NI-05

Eligible Content:

- Determine potential solutions to solve simple hardware and software problems using common troubleshooting strategies.
- Model how information is broken down into smaller pieces, transmitted as packets through multiple devices over networks and the Internet, and reassembled at the destination.
- Discuss real-world cybersecurity problems and how personal information can be protected.

Instructional Strategies:

Teacher Demonstration on the Smartboard
Student Interaction Using Smartboard
Teacher Discussion
Independent Student Practice on Computers

Assessments:

- Sending Emails
- Sending Attachments over Email
- Teacher Observation

Grade level: 4th Grade | **Course Title: STEM** | **Topic/Concept: PLTW Input/Output**

Time Allotment: 20 classes | **Unit Sequence: 6**

Major Concepts to be learned:

- Follow a step-by-step method to solve a problem.
- Use scientific reasoning to ask questions, make observations, and investigate ideas to acquire knowledge and solve problem
- Apply computational thinking to solve problems.

Expected Skills to be demonstrated:

- Create a game that requires input to produce output
- Include a win screen and lose screen
- Include the functions of a game (pong game, chase game, clicker game)
- Make and use a model to test a design or aspects of a design, and to compare the effectiveness of different design solutions.
- Evaluate a model solution through observations and/or measurements and consider what revisions to the initial model are needed.

- Ask and identify questions to gain knowledge or solve problems
- Develop programs with sequences and simple loops, to express ideas or address a problem
- Decompose (break down) the steps to solve a problem into a precise sequence of instructions.
- Demonstrate persistence in the cycle of testing, finding, and fixing.
- Debug (identify and fix) errors in an algorithm or program that includes sequences

PA Standards/Anchors:

CSTA Standards –

1B-CS-01	1B-CS-02
1B-CS-03	1B-NI-04
1B-NI-05	1B-DA-06
1B-DA-07	1B-IC-19
1B-IC-20	1B-AP-08
1B-AP-09	1B-AP-10
1B-AP-11	1B-AP-12
1B-AP-13	1B-AP-14
1B-AP-15	1B-AP-16
1B-AP-17	

Eligible Content

- Model how computer hardware and software work together as a system to accomplish tasks.
- Determine potential solutions to solve simple hardware and software problems using common troubleshooting strategies.
- Compare and refine multiple algorithms for the same task and determine which is the most appropriate.
- Create programs that include sequences, events, loops, and conditionals.
- Decompose (break down) problems into smaller, manageable subproblems to facilitate the program development process.
- Use an iterative process to plan the development of a program by including others' perspectives and considering user preferences.
- Test and debug (identify and fix errors) a program or algorithm to ensure it runs as intended.
- Take on varying roles, with teacher guidance, when collaborating with peers during the design, implementation, and review stages of program development.
- Describe choices made during program development using code comments, presentations, and demonstrations.
- Describe how internal and external parts of computing devices function to form a system

Instructional Strategies:

Teacher Demonstration on the Smartboard
Student Interaction Using Smartboard
Guided Student Practice on Computers
Independent Student Practice on Computers

Assessments:

- Computer Based Projects (Scratch)
- Final Project (Choose your own Adventure Story) Scratch
- Teacher Observation

Grade level: 4th Grade | **Course Title: STEM** | **Topic/Concept: Coding (Code.org)**

Time Allotment: 10 classes | **Unit Sequence: 7**

Major Concepts to be learned:

- Students will develop sequential algorithms
- Students will stack code blocks together in a linear sequence.
- Students will practice loops in programming puzzles
- Students will find and fix errors in algorthms using the design process

Expected Skills to be demonstrated:

- Demonstrate the ability to create algoritms to achieve a predetermined goal
- Demonstrate the ability to use loops in the programming pattern
- Demonstrate the ability to "debug" a program when the goal is not met.

PA Standards/Anchors:

CSTA Standards -

1B-AP-12	1B-AP-15
1B-AP-10	1B-AP-13
1B-DA-06	1A-AP-11
1B-AP-09	1B-DA-07
1B-AP-08	1B-AP-17
1B-NI-05	1B-CS-03
1B-IC-18	1B-IC-19
1B-IC-20	

Eligible Content:

- Modify, remix or incorporate portions of an existing program into one's own work,
- to develop something new or add more advanced features.
- Test and debug (identify and fix errors) a program or algorithm to ensure it runs as intended.
- Create programs that include sequences, events, loops, and conditionals.
- Decompose (break down) the steps needed to solve a problem into a precise sequence of instructions.
- Create programs that use variables to store and modify data.
- Create programs that include sequences, events, loops, and conditionals.
- Organize and present collected data visually to highlight relationships and support a claim.

Instructional Strategies:

Teacher Demonstration on the Smartboard
Guided Student Practice on Computers

Assessments:

- Computer Based Project
- Teacher Observation