Full Steam Ahead - 30 Day Unit

Content Area: **Generic Content Area**
Course(s): **Intro to Computer Applications**
Time Period: **Generic Time Period**
Length: **30 Days**
Status: **Published**

Unit Overview

Through this Scratch-based curriculum, students understand the fundamental ideas about computers and programming, and develop some basic problem-solving and project design skills.

Transfer

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

- Computer programs tell the computer precisely what to do in a step-by-step manner.
- Writing computer programs does not take a heroic effort; it just requires some clear and careful thinking and planning.
- Problem solving requires that you understand what a given problem is about, develop some initial ideas for a solution to the problem, refine and revise your ideas through analysis and logical reasoning, and complete your solution through sustained focus and perseverance.
- Basic simple circuit design to power LEDs and Move motors
- Ohm's Law and how to to calculate resistance etc.
- Series and Parallel circuits

For more information, read the following article by Grant Wiggins.

http://www.authenticeducation.org/ae_bigideas/article.lasso?artid=60

Meaning

Understandings

Students will understand that...

- Computer programs tell the computer precisely what to do in a step-by-step manner.
- Writing computer programs does not take a heroic effort; it just requires some clear and careful thinking and planning.
- Problem solving requires that you understand what a given problem is about, develop some initial ideas for a solution to the problem, refine and revise your ideas through analysis and logical reasoning, and complete your solution through sustained focus and perseverance.

Essential Questions

Students will keep considering...

- How can creative computing help one use computational concepts across many disciplines and contexts?
- How can engaging in creative computing prepare one for a career as a computer scientist or programmer?
- How does interacting with a computer as a designer, rather than a consumer, increase knowledge, creativity, imagination, and literacy?
- How can reflection enable us to grow and learn?
- How can creative computing help one use computational concepts across many disciplines and contexts?
- How can engaging in creative computing prepare one for a career as a computer scientist or programmer?
- How does interacting with a computer as a designer, rather than a consumer, increase knowledge, creativity, imagination, and literacy?
- How can reflection enable us to grow and learn?

Application of Knowledge and Skill

Students will know...

Students will know...

- Creative computing offers opportunities to design and make for the computer, not just listen, observe, . and use
- Creative computing offers opportunities to engage with others as audience, coaches, and co-creators .
- Reflecting about your practice enables one to review and rethink your creation
- Creative computing offers opportunities to design and make for the computer, not just listen,

observe, and use
- Creative computing offers opportunities to engage with others as audience, coaches, and co-creators .
- Reflecting about your practice enables one to review and rethink your creation

Students will be skilled at...

Students will be able to:

- Add a project to a studio .
- Engage in an exploratory, hands-on experience with Scratch .
- Establish a Scratch account .
- Explore the Scratch online community and review the Scratch community guidelines .
- Give appropriate feedback on design ideas and works-in-progress within a critique group .
- Post comments on other Scratch projects .
- Start a personalized design journal for documenting their design process and reflections

Academic Vocabulary

Key words, Concepts, & Practices

profile editor

project page

studeio

critique group

red, yellow, green

experimenting and iterating

testing and debugging

sequence

sprite

motion

looks

sound

costume

backdrop

tips window

remix

intearactive collage

pair-share

loops

events

paralleslism

control

braodcast

scripts

presentation mode

bitmap

vector

animation

gallery walk

resuing adn remixing

make a block

backpack

stage

pass-it-on story

pair programming

scratch screening

design demo

Learning Goal 1

Prepare for the culture of creative computing by exploring possibilities and setting up technical infrastructure (e.g., creating Scratch accounts, starting design journals) and social infrastructure (e.g., establishing critique groups). Dive into an initial creative experience by making something "surprising" happen to a Scratch character. Get comfortable with the key computational concept of sequence through a series of activities that provide varying levels of structure – from a step-by-step tutorial, to a creative challenge using a limited number of blocks, to open-ended explorations through making a project about yourself.

Full Steam Ahead - Proficiency Scale LG 1

TECH.8.1.5.A	Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations.
TECH.8.1.5.A.CS1	Understand and use technology systems
TECH.8.1.5.A.CS2	Select and use applications effectively and productively.
TECH.8.1.5.C.CS1	Interact, collaborate, and publish with peers, experts, or others by employing a variety of digital environments and media
TECH.8.1.8.B	Creativity and Innovation: Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.
TECH.8.1.8.B.CS1	Apply existing knowledge to generate new ideas, products, or processes.
TECH.8.1.8.B.CS2	Create original works as a means of personal or group expression.
TECH.8.2.8.A.CS1	The characteristics and scope of technology.
TECH.8.2.8.A.CS2	The core concepts of technology.
TECH.8.2.8.D.CS1	Apply the design process.
TECH.8.2.8.E.4	Use appropriate terms in conversation (e.g., programming, language, data, RAM, ROM, Boolean logic terms).

Target 1

Students will prepare for creating Scratch projects by establishing Scratch accounts, exploring Scratch studios, creating design journals, and organizing critique groups

Target 2

Students will:
+build on initial explorations of the Scratch environment by creating an interactive Scratch project

+be introduced to a wider range of Scratch blocks

+become familiar with the concept of sequence

+practice experimenting and iterating while creating projects

Learning Goal 2

Play with visuals and audio in these activities focused on animation, art, and music. Explore Scratch's focus on media – and the key computational concepts of loops, events, and parallelism – by building your own band, designing animated creatures, and creating a music video for a favorite song.

Full Steam Ahead - Proficiency Scale LG 2

TECH.8.1.5.A	Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations.
TECH.8.1.5.A.CS1	Understand and use technology systems
TECH.8.1.5.A.CS2	Select and use applications effectively and productively.
TECH.8.1.5.C.CS1	Interact, collaborate, and publish with peers, experts, or others by employing a variety of digital environments and media
TECH.8.1.8	Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
TECH.8.1.8.A.CS2	Select and use applications effectively and productively.
TECH.8.1.8.B	Creativity and Innovation: Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.
TECH.8.1.8.B.CS1	Apply existing knowledge to generate new ideas, products, or processes.
TECH.8.1.8.B.CS2	Create original works as a means of personal or group expression.
TECH.8.1.8.C.CS1	Interact, collaborate, and publish with peers, experts, or others by employing a variety of digital environments and media.
TECH.8.1.8.D.CS1	Advocate and practice safe, legal, and responsible use of information and technology.
TECH.8.1.8.E.CS4	Process data and report results.

Target 1

Students will:
+ be introduced to the computational thinking concepts of loops, events, and parallelism

+ become more familiar with the concepts of sequence

Target 2

Students will:

+ experiment with new blocks in the Events, Control, Sound, and Looks categories + explore various arts-themed Scratch programs
+ create an animated music video project

Learning Goal 3

Create new interactive worlds through collaborative storytelling. Begin by developing characters, learning to code conversations, and then situating those characters and conversations in shifting scenes. Combine characters, conversations, and scenes in a larger story project that is passed along to other creators to further develop – and possibly reimagine entirely!

Full Steam Ahead - Proficiency Scale 3

TECH.8.1.5.A	Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations.
TECH.8.1.5.A.CS1	Understand and use technology systems
TECH.8.1.5.A.CS2	Select and use applications effectively and productively.
TECH.8.1.5.C.CS1	Interact, collaborate, and publish with peers, experts, or others by employing a variety of digital environments and media
TECH.8.1.8	Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
TECH.8.1.8.A.CS2	Select and use applications effectively and productively.
TECH.8.1.8.B	Creativity and Innovation: Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.
TECH.8.1.8.B.CS1	Apply existing knowledge to generate new ideas, products, or processes.
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TECH.8.1.8.D.CS1	Advocate and practice safe, legal, and responsible use of information and technology.
TECH.8.1.8.E.CS4	Process data and report results.

Target 1

Students will:

+gain familiarity in and build understandings of the benefits of reusing and remixing while designing

+ develop greater fluency with computational concepts (events and parallelism) and practices (experimenting and iterating, testing and debugging, reusing and remixing)

Target 2

Students will:

+ explore computational creation within the genre of stories by designing collaborative narratives

Target 3

Learning Goal 4

Solve simple circuits that include a dependent voltage source.

Full Steam Ahead - Proficiency Scale 4

SCI.3-5-ETS1-2	Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
TECH.8.1.5	Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
TECH.8.2.5.C	Design: The design process is a systematic approach to solving problems.
TECH.8.2.5.E.2	Demonstrate an understanding of how a computer takes input of data, processes and stores the data through a series of commands, and outputs information.
TECH.8.2.5.E.4	Use appropriate terms in conversation (e.g., algorithm, program, debug, loop, events, procedures, memory, storage, processing, software, coding, procedure, and data).
TECH.8.2.8.A.CS1	The characteristics and scope of technology.
TECH.8.2.8.A.CS2	The core concepts of technology.
3-5-ETS1-3	Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

Target 1

Students will explore the basic structure and functions of TinkerCad Circuits Program such as Simulating,

editing Components, wiring Components, adding Components.

Target 2

Students will explore simple circuits, using a digital breadboard, Ohm's Law and understanding Series and Parallel Circuits.

Summative Assessment

Project based assessment
Rubrics
Student led self-assessment
Teacher Observations
Successful completion of tutorial
Design Journal (personal reflection and self assessment by student)

21st Century Life and Careers

CAEP.9.2.8.B.1	Research careers within the 16 Career Clusters ® and determine attributes of career success.
CAEP.9.2.8.B.2	Develop a Personalized Student Learning Plan with the assistance of an adult mentor that includes information about career areas of interest, goals and an educational plan.
CAEP.9.2.8.B.3	Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.

Formative Assessment and Performance Opportunities

+supporting conversations with and among students about their projects, recorded through audio, video, or text
+examining portfolios of projects
+maintaining design journals

Differentiation/Enrichment

Peer-to-peer "Tech Buddy" support

Students may work at their own pace

Advanced students may use their computer skills to enhance their Scratch program

Students who complete the daily assignment and are up-to-date on all projects may choose from one of the following activities if time permits in the period:

Typing Agent

Hour of Code

Nitro Type

CodeCombat

Unit Resources

Creative Computing

Coding Unit Resources

30 Day Map