Grade 4 Technology Unit 3: STEM Project 3D Printer

Content Area: **Technology**
Course(s): **Technology Grade 4**
Time Period: **MP3**
Length: **7 days**
Status: **Published**

NJSLS - Computer Science and Design Thinking

CS.3-5.8.1.5.CS.1	Model how computing devices connect to other components to form a system.
CS.3-5.8.1.5.CS.2	Model how computer software and hardware work together as a system to accomplish tasks.
CS.3-5.8.1.5.CS.3	Identify potential solutions for simple hardware and software problems using common troubleshooting strategies.

Rationale and Transfer Goals

In this unit, students will get the opportunity to explore basic robotics through a 3D printer and Tinkercad.com. They will learn about basic 3D designs and how 3D printers work. Students will create different 3D objects and their final project will be a 3D keychain of their name. This exposure to STEM could spark interest in scientific study later in their education and beyond.

Enduring Understandings

In order for a 3D image to be created and printed, design and scaling must be done properly.

Essential Questions

What is 3D printing?

What are the benefits of 3D printing?

Content - What will students know?

- Basic capabilities of a 3d printer.

- Create Simple Objects with a 3d printer.

- Create a Name Keychain with a 3d printer.

Skills - What will students be able to do?

- Students will be able to use the basic actions of tinkercad.com, including looking at their design from multiple angles, resizing their 3d shapes, and combining multiple shapes into 1 shape.

- Students will create simple designs using their skills learned in previous lessons.

- Students will create a simple keychain of their name using their skills learned in previous lessons.

Activities - How will we teach the content and skills?

- Whole class demonstration of the tinkercad program and 3d printer, followed by students completing their Learn the Moves modules on tinkercad.com.

- Whole class demonstration of using their previously learned skills to create 3 3d objects: a ring, a button and a keychain. Students will then independently create these objects and save and share their print file with the teacher.

- Whole class demonstration of using their previously learned skills to create a 3d keychain of their name.

- Students will then independently save and share their print file with the teacher.

Evidence/Assessments - How will we know what students have learned?

- Evaluation of Learn the Moves results. (Place It, View It, Move It, Rotate It, Size It Up, Group I, Copy It, Align It)

- Evaluation of practice objects: Simple Heart Ring, Basic Button, and Key Ring Letters (Katie).

- Evaluation of student creation

- (Key Ring Letters of their own name).

Spiraling for Mastery

Content or Skill for this Unit	Spiral Focus from Previous Unit	Instructional Activity
Tinkercad.com exploration of tools and practice of skills	Creating a 3D working invention	Create a new invention to better help humanity.

Key Resources

BrainPop

Tinkercad.com

3D printer and filament

21st Century Life and Careers

WRK.9.2.5.CAP.1   Evaluate personal likes and dislikes and identify careers that might be suited to personal likes.

WRK.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.

Career Readiness, Life Literacies, & Key Skills

TECH.9.4.5.CT.3   Describe how digital tools and technology may be used to solve problems.

Interdisciplinary Connections/Companion Standards

Literacy and language arts in the technology context: writing, programming, word processing, and creativity with language

Science: understanding of computer components, operations of touchscreens and other user devices

Social Studies: Computers in the context of society; our relationships to computers as a tool

Health: Limits to screen time and healthy relationships with technology, online technologies

Science: Principles of engineering and construction; science in application in the context of robotics

Extensive connections across the STEM subjects; the unit is designed to encourage students to draw on STEM disciplines as a whole

SCI.3-5-ETS1-1	Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.