

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

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| 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

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|-----------------|---|
| 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

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