

Unit 2: Introduction to TinkerCAD

Content Area: **Template**
Course(s):
Time Period: **Full Year**
Length: **Full Year**
Status: **Published**

UNIT RATIONALE

Unit Rationale: The Introduction to TinkerCAD unit focuses on 3D modeling and design, providing students with a hands-on experience in creating and visualizing three-dimensional objects. TinkerCAD offers a user-friendly interface that enables students to develop spatial reasoning, critical thinking, and design skills. This unit aims to inspire students' creativity and encourage them to explore the practical applications of 3D modeling and printing in fields such as engineering, architecture, and product design.

ESSENTIAL QUESTIONS

1. What is 3D modeling, and how is it used in various industries?
2. How can we use TinkerCAD to create and design 3D models?
3. What are the practical applications of 3D printing?

STANDARDS

NEW JERSEY STUDENT LEARNING STANDARDS: CONTENT AREA

New Jersey (NJSL) - Grades 6-8 - Computer Science and Design Thinking (2020)

8.1.8.CS.3:

Justify design decisions and explain potential system trade-offs.

8.1.8.NI.1:

Model how information is broken down into smaller pieces, transmitted as addressed packets through multiple devices over networks and the Internet, and reassembled at the destination.

8.1.8.NI.2:

Model the role of protocols in transmitting data across networks and the Internet and how they enable secure and errorless communication.

8.1.8.NI.3:

Explain how network security depends on a combination of hardware, software, and practices that control access to data and systems.

8.1.8.NI.4:

Explain how new security measures have been created in response to key malware events.

8.1.8.IC.1:

Compare the trade-offs associated with computing technologies that affect individual's everyday activities and career options.

8.1.8.IC.2:

Describe issues of bias and accessibility in the design of existing technologies.

8.1.8.DA.2:

Explain the difference between how the computer stores data as bits and how the data is displayed.

8.1.8.DA.3:

Identify the appropriate tool to access data based on its file format.

8.1.8.DA.4:

Transform data to remove errors and improve the accuracy of the data for analysis.

8.1.8.DA.5:

Test, analyze, and refine computational models.

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|-------------------|---|
| CS.6-8.8.1.8.CS.3 | Justify design decisions and explain potential system trade-offs. |
| CS.6-8.8.1.8.DA.2 | Explain the difference between how the computer stores data as bits and how the data is displayed. |
| CS.6-8.8.1.8.DA.3 | Identify the appropriate tool to access data based on its file format. |
| CS.6-8.8.1.8.DA.4 | Transform data to remove errors and improve the accuracy of the data for analysis. |
| CS.6-8.8.1.8.DA.5 | Test, analyze, and refine computational models. |
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| CS.6-8.8.1.8.IC.2 | Describe issues of bias and accessibility in the design of existing technologies. |
| CS.6-8.8.1.8.NI.1 | Model how information is broken down into smaller pieces, transmitted as addressed packets through multiple devices over networks and the Internet, and reassembled at the destination. |
| CS.6-8.8.1.8.NI.2 | Model the role of protocols in transmitting data across networks and the Internet and how they enable secure and errorless communication. |
| CS.6-8.8.1.8.NI.3 | Explain how network security depends on a combination of hardware, software, and practices that control access to data and systems. |
| CS.6-8.8.1.8.NI.4 | Explain how new security measures have been created in response to key malware events. |

NEW JERSEY STUDENT LEARNING STANDARDS: CAREER READINESS, LIFE LITERACIES AND KEY SKILLS

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|-------------------|--|
| CS.6-8.8.1.8.CS.4 | Systematically apply troubleshooting strategies to identify and resolve hardware and software problems in computing systems. |
| CS.6-8.8.1.8.DA.1 | Organize and transform data collected using computational tools to make it usable for a specific purpose. |
| CS.6-8.8.1.8.DA.2 | Explain the difference between how the computer stores data as bits and how the data is displayed. |
| CS.6-8.8.1.8.DA.3 | Identify the appropriate tool to access data based on its file format. |
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| CS.6-8.8.1.8.DA.5 | Test, analyze, and refine computational models. |
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| CS.6-8.8.1.8.NI.4 | Explain how new security measures have been created in response to key malware events. |

NEW JERSEY STUDENT LEARNING STANDARDS: COMPUTER SCIENCE AND DESIGN THINKING

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| CS.6-8.8.1.8.DA.1 | Organize and transform data collected using computational tools to make it usable for a specific purpose. |
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PRE-ASSESSMENTS

Using TinkerCAD, design a complex 3 dimensional object.

INSTRUCTIONAL PLAN

MODULE 1

Success Criteria:

1. Students will demonstrate proficiency in using TinkerCAD for 3D modeling.
2. Students will create 3D models that meet specific design criteria and constraints.
3. Students will understand the basics of 3D printing and its applications.

Learning Strategies:

1. Guided tutorials and demonstrations on using TinkerCAD.
2. Hands-on design exercises and challenges.
3. Collaborative projects to promote peer feedback and iteration.
4. Field trips or guest speakers to explore real-world applications of 3D printing.

Learning Intentions:

1. Develop skills in 3D modeling and design using TinkerCAD.
2. Understand the practical applications of 3D printing.
3. Foster creativity, problem-solving, and critical thinking through design challenges.

NJ Content Standards: 6.2.8.A.1, 6.2.8.A.2, 6.2.8.A.3, 6.2.8.B.1, 6.2.8.B.2, 6.2.8.C.1

Small Projects:

1. Design and 3D print a customized keychain.
2. Create a model of a famous landmark or architectural structure.
3. Design a functional tool or gadget that solves a specific problem.

Large Project:

Collaboratively design and create a 3D model of a community or school improvement project, such as a playground or public art installation.

REFLECTIONS

INTERDISCIPLINARY CONNECTIONS: NEW JERSEY STUDENT LEARNING STANDARDS FOR ELA, SOCIAL STUDIES, SCIENCE AND/OR MATHEMATICS

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| CS.6-8.8.1.8.NI.3 | Explain how network security depends on a combination of hardware, software, and practices that control access to data and systems. |

CS.6-8.8.1.8.NI.4

Explain how new security measures have been created in response to key malware events.