Unit 3: Design Thinking

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

UNIT RATIONALE

Unit Rationale: The Design Challenge unit takes a project-based approach to engage students in the design thinking process. This unit emphasizes problem-solving, critical thinking, and collaboration as students tackle real-world challenges. Through design challenges and iterative problem-solving, students develop skills in identifying problems, generating innovative solutions, and effectively communicating their ideas. This unit fosters creativity, empathy, and resilience, preparing students to become innovative problem solvers in various domains.

ESSENTIAL QUESTIONS

1. How can we apply the design thinking process to solve real-world problems?
2. What are the key steps and strategies involved in the design process?
3. How can we effectively communicate and present our design solutions?

STANDARDS

NEW JERSEY STUDENT LEARNING STANDARDS: CONTENT AREA

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

8.1.8.DA.6:

Analyze climate change computational models and propose refinements.

8.2.8.ED.2:

Identify the steps in the design process that could be used to solve a problem.

8.2.8.ED.3:

Develop a proposal for a solution to a real-world problem that includes a model (e.g., physical prototype, graphical/technical sketch).

8.2.8.ED.4:

Investigate a malfunctioning system, identify its impact, and explain the step-by-step process used to troubleshoot, evaluate, and test options to repair the product in a collaborative team.

8.2.8.ED.5:

Explain the need for optimization in a design process.

8.2.8.ED.6:

Analyze how trade-offs can impact the design of a product.

8.2.8.ED.7:

Design a product to address a real-world problem and document the iterative design process, including decisions made as a result of specific constraints and trade-offs (e.g., annotated sketches).

8.2.8.ITH.1:

Explain how the development and use of technology influences economic, political, social, and cultural issues.

*add*Standards

comment

help

CS.6-8.8.1.8.DA.6	Analyze climate change computational models and propose refinements.
CS.6-8.8.2.8.ED.2	Identify the steps in the design process that could be used to solve a problem.
CS.6-8.8.2.8.ED.3	Develop a proposal for a solution to a real-world problem that includes a model (e.g., physical prototype, graphical/technical sketch).
CS.6-8.8.2.8.ED.4	Investigate a malfunctioning system, identify its impact, and explain the step-by-step process used to troubleshoot, evaluate, and test options to repair the product in a collaborative team.
CS.6-8.8.2.8.ED.5	Explain the need for optimization in a design process.
CS.6-8.8.2.8.ED.6	Analyze how trade-offs can impact the design of a product.
CS.6-8.8.2.8.ED.7	Design a product to address a real-world problem and document the iterative design process, including decisions made as a result of specific constraints and trade-offs (e.g., annotated sketches).
CS.6-8.8.2.8.ITH.1	Explain how the development and use of technology influences economic, political, social, and cultural issues.

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

CS.6-8.8.2.8.EC.1	Explain ethical issues that may arise from the use of new technologies.
CS.6-8.8.2.8.EC.2	Examine the effects of ethical and unethical practices in product design and development.

NEW JERSEY STUDENT LEARNING STANDARDS: COMPUTER SCIENCE AND DESIGN THINKING

CS.6-8.8.2.8.ED.2	Identify the steps in the design process that could be used to solve a problem.
CS.6-8.8.2.8.ED.3	Develop a proposal for a solution to a real-world problem that includes a model (e.g., physical prototype, graphical/technical sketch).
CS.6-8.8.2.8.ED.4	Investigate a malfunctioning system, identify its impact, and explain the step-by-step

	process used to troubleshoot, evaluate, and test options to repair the product in a collaborative team.
CS.6-8.8.2.8.ED.5	Explain the need for optimization in a design process.
CS.6-8.8.2.8.ED.6	Analyze how trade-offs can impact the design of a product.
CS.6-8.8.2.8.ED.7	Design a product to address a real-world problem and document the iterative design process, including decisions made as a result of specific constraints and trade-offs (e.g., annotated sketches).

PRE-ASSESSMENTS

Design challenge and process assessment

INSTRUCTIONAL PLAN

MODULE 1

Success Criteria:
1. Students will demonstrate an understanding of the design thinking process.

2. Students will apply design thinking principles to solve a real-world problem.
3. Students will effectively communicate and present their design solutions.

Learning Strategies:
1. Introduction to the design thinking process and its key elements.
2. Design challenges and problem-solving activities.
3. Brainstorming sessions and prototyping.
4. Peer feedback and iteration.
5. Presentation and communication skills development.

Learning Intentions:
1. Apply the design thinking process to identify, analyze, and solve problems.
2. Develop critical thinking, creativity, and collaboration skills.
3. Enhance communication and presentation skills.

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 a solution to improve a school or community space.
2. Create a prototype of a sustainable packaging solution.
3. Design a product that addresses a specific user need or challenge.

Large Project:
Collaboratively tackle a design challenge that addresses a real-world problem or community need. Students will go through the entire design thinking process, from problem identification to prototyping and presentation of their solutions.

REFLECTIONS

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