Looking at our Community through a DT Process

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Courses written prior to 2014 were updated to align with the 2014 New Jersey Core Content Curriculum Standards and were approved by the Ridgewood Board of Education on August 24, 2015. The addendum at the link below serves as the update to any curriculum written prior to 2014.

Curriculum Addendum NJCCCS 2014

Unit Overview and Desired Outcomes

ENDURING UNDERSTANDINGS -- Overarching Unit Ideas

Students will trust the Design Thinking process, even if it feels nonlinear, to help them improve anything, with anyone, in the world around them.

ESSENTIAL QUESTIONS -- To guide instruction

How do people effectively use the Design Thinking tools in larger teams to identify and solve problems within a community?

MAJOR CONTENT OR CONCEPTS BEING TAUGHT IN THE UNIT

Design Thinking strategies and processes

- Imagining Ideas
- Prototyping
- Observing
- Framing a point of view
- Effective collaboration & communication

Collaborating as a large team in problem solving for addressing community systems

SKILLS - Which students will acquire or practice

- Develop Insight Statements
- Create "How Might We" questions
- Develop and use various visual frameworks
- Bundle Ideas
- Run co-creating sessions
- Develop skills to determine what to prototype
- Organize ideas and strategies by using the various quadrants of the design compass
- Develop interview and recording skills that help to deeply see, and question, the way things are around us, helping to question assumptions.

KEY VOCABULARY AND PHRASES

"How Might We" questions
Rapid prototyping for rapid failure
Personal, contextual, or social assumptions
INSTRUCTIONAL STRATEGIES

- Teacher demonstration
- Self-Assessment/Peer Review
- Small Group Activities
- Questioning Techniques
- Cooperative Learning Structures
- Case studies
- Writing
- Discussions
- Iterative Processes
- Group Projects
- Presentation

Differentiation

Differentiation for Support
(ELL, Spec.Ed, Struggling Learners)

- Use the Design Thinking process to self-evaluate
- Model skills / techniques to be mastered
- Assist student with long and short term planning of assignments
- Encourage student to revise and improve assignments
- Restate, reread, and clarify directions/questions
- Provide visual frameworks

Differentiation for Enrichment

- Use the Design Thinking process to self-evaluate
- Encourage self implementation of presented topics
- Authentic listening and reading sources that provide data and support for various projects/performances
- Develop and use their own visual frameworks

Assessment FOR and OF Learning

Assessments

- Test Debrief & Product Plan Review
  - Formative: Performance: Lab Assignment
  - 4-15 Design Project - DESIGN REVIEW 3 In-Home Test Debrief & Product Plan Verbal Review - Rubric.pdf

Suggested Best-Practice Learning Plan (WALT - We are learning to...) (by...)

(WeAreLearningTo...) Learning Objective 1
(By...) Best Practice Lesson/Activities for
<table>
<thead>
<tr>
<th>Imagine Ideas</th>
<th>Obj. 1</th>
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<tbody>
<tr>
<td></td>
<td>• To get a fresh perspective on your creativity, shift your focus to a new context or setting.</td>
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<td>• Explore your hunches: if you've got a feeling about something, give yourself a chance to explore it.</td>
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<td>• Translate insight statements into opportunities for design by re-framing them as &quot;How might We&quot; questions.</td>
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<thead>
<tr>
<th>(WALT...) Learning Objective 2</th>
<th>(By...) Best Practice Lesson/Activities for Obj. 2</th>
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<tbody>
<tr>
<td>Prototype experiments</td>
<td>• Work with various groups through a prototyping session</td>
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<td></td>
<td>• See the value in rapid prototyping and rapid failure</td>
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<tr>
<th>(WALT...) Learning Objective 3</th>
<th>(By...) Best Practice Lesson/Activities for Obj. 3</th>
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<tr>
<td>Immerse for observation</td>
<td>• Emphasize and co-design with very different individuals</td>
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<td></td>
<td>• There is no better way to understand a problem than to immerse yourself in the lives and communities of the people dealing with the problems.</td>
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<td></td>
<td>• Interview a very broad range of people knowing that different people can offer valuable new ideas, while also understanding that a fresh outside perspective can help them see their own world in new ways.</td>
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<tr>
<th>(WALT...) Learning Objective 4</th>
<th>(By...) Best Practice Lesson/Activities for Obj. 4</th>
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<tr>
<td>Frame a point of view</td>
<td>• See the value in role playing</td>
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<td></td>
<td>• Use the various quadrants of the design compass to frame out an idea</td>
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<thead>
<tr>
<th>(WALT...) Learning Objective 5</th>
<th>(By...) Best Practice Lesson/Activities for Obj. 5</th>
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<td>Effective collaboration &amp; communication</td>
<td>• Successful problem solving requires the development of trust and understanding; community design techniques help cultivate this.</td>
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<td></td>
<td>• Create a compelling pitch to communicate your ideas to an audience</td>
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<td>Learning Objective 6</td>
<td>Best Practice Lesson/Activities for Obj. 6</td>
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<tr>
<td>Learning Objective 7</td>
<td>Best Practice Lesson/Activities for Obj. 7</td>
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<td>Learning Objective 8</td>
<td>Best Practice Lesson/Activities for Obj. 8</td>
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<td>Learning Objective 9</td>
<td>Best Practice Lesson/Activities for Obj. 9</td>
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<td>Learning Objective 10</td>
<td>Best Practice Lesson/Activities - Obj. 10</td>
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**Resources and Technology Integration**

**Text Resources and Materials**


**Technology for Student Learning**
Standards

NJSLS-S: Science and Engineering Practices

Practice 1. Asking questions (for science) and defining problems (for engineering)

Asking questions and defining problems in 9–12 builds on K–8 experiences and progresses to formulating, refining, and evaluating empirically testable questions and design problems using models and simulations.

- Ask questions that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information.
- Ask questions to clarify and refine a model, an explanation, or an engineering problem.
- Ask and/or evaluate questions that challenge the premise(s) of an argument, the interpretation of a data set, or the suitability of a design.
- Define a design problem that involves the development of a process or system with interacting components and criteria and constraints that may include social, technical, and/or environmental considerations.

Practice 2. Developing and using models

Modeling in 9–12 builds on K–8 experiences and progresses to using, synthesizing, and developing models to predict and show relationships among variables between systems and their components in the natural and designed worlds.

- Develop, revise, and/or use a model based on evidence to illustrate and/or predict the relationships between systems or between components of a system.

Practice 3. Planning and carrying out investigations

Planning and carrying out investigations in 9-12 builds on K-8 experiences and progresses to include investigations that provide evidence for and test conceptual, mathematical, physical, and empirical models.

- Plan and conduct an investigation or test a design solution in a safe and ethical manner including considerations of environmental, social, and personal impacts.
- Select appropriate tools to collect, record, analyze, and evaluate data.

Practice 7. Engaging in argument from evidence

Engaging in argument from evidence in 9–12 builds on K–8 experiences and progresses to using appropriate and sufficient evidence and scientific reasoning to defend and critique claims and explanations about the natural and designed world(s). Arguments may also come from current scientific or historical episodes in science.

- Compare and evaluate competing arguments or design solutions in light of currently accepted explanations, new evidence, limitations (e.g., tradeoffs), constraints, and ethical issues.
- Construct, use, and/or present an oral and written argument or counter-arguments based on data and evidence.

NJSLS-S: Disciplinary Core Ideas

ETS1: Engineering Design

ETS1.C: Optimizing the Design Solution

- Criteria may need to be broken down into simpler ones that can be approached systematically, and decisions about the priority of certain criteria over others (tradeoffs) may be needed. (HSETS1-2) (secondary to HS-PS1-6) (secondary to HS-PS2-3)

NJ: 2016 SLS: English Language Arts

NJ: Grades 11-12

Capacities of the Literate Individual

Students Who are College and Career Ready in Reading, Writing, Speaking, Listening, & Language

- They demonstrate independence.
- They build strong content knowledge.
- They respond to the varying demands of audience, task, purpose, and discipline.
- They comprehend as well as critique.
- They value evidence.
- They use technology and digital media strategically and capably.
- They come to understand other perspectives and cultures.

Speaking and Listening

Comprehension and Collaboration

NJSLSA.SL1 Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others’ ideas and expressing their own clearly and persuasively.
SL.11-12.1. Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with peers on grades 11–12 topics, texts, and issues, building on others’ ideas and expressing their own clearly and persuasively.

SL.11-12.1a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.

SL.11-12.1c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.

SL.11-12.1d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task.

NJSLSA.SL2 Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

• SL.11-12.2. Integrate multiple sources of information presented in diverse media or formats (e.g., visually, quantitatively, qualitatively, orally) evaluating the credibility and accuracy of each source.

Presentation of Knowledge and Ideas

NJSLSA.SL4 Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

• SL.11-12.4 Present information, findings and supporting evidence clearly, concisely, and logically. The content, organization, development, and style are appropriate to task, purpose, and audience.

NJSLSA.SL5 Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

• SL.11-12.5. Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.

NJ: 2016 SLS: Literacy in History/Social Studies, Science, & Technical Subjects 6-12

NJ: Grades 11-12

Writing

Research to Build and Present Knowledge

NJSLSA.W7 Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

• WHST.11-12.7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.


NJ: Grade 12


Design/pre-construction (AC-DES)

• 9.3.12.AC-DES.1 Justify design solutions through the use of research documentation and analysis of data.
• 9.3.12.AC-DES.2 Use effective communication skills and strategies (listening, speaking, reading, writing and graphic communications) to work with clients and colleagues.
• 9.3.12.AC-DES.5 Identify the diversity of needs, values and social patterns in project design, including accessibility standards.
• 9.3.12.AC-DES.7 Employ appropriate representational media to communicate concepts and project design.

9.3 – Career & Technical Education (CTE): Education & Training Career Cluster®

Career Cluster®: Education & Training (ED)

• 9.3.12.ED.2 Demonstrate effective oral, written and multimedia communication in multiple formats and contexts.
• 9.3.12.ED.3 Use critical thinking to process educational communications, perspectives, policies and/or procedures.
• 9.3.12.ED.5 Demonstrate group collaboration skills to enhance professional education and training practice.

NJ: 2014 SLS: Technology

NJ: Grades 9-12

8.1 Educational Technology

8.1 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.

A. Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations.

• 8.1.12.A.3 Collaborate in online courses, learning communities, social networks or virtual worlds to discuss a resolution to a problem or issue.

8.2 Technology Education, Engineering, Design, and Computational Thinking

C. Design: The design process is a systematic approach to solving problems.

• 8.2.12.C.2 Analyze a product and how it has changed or might change over time to meet human needs and wants.
• 8.2.12.C.3 Analyze a product or system for factors such as safety, reliability, economic considerations, quality control, environmental concerns, manufacturability, maintenance and repair, and human factors engineering (ergonomics).
• 8.2.12.C.4 Explain and identify interdependent systems and their functions.
• 8.2.12.C.6 Research an existing product, reverse engineer and redesign it to improve form and function.
D. Abilities for a Technological World: The designed world is the product of a design process that provides the means to convert resources into products and systems.

- 8.2.12.D.1 Design and create a prototype to solve a real world problem using a design process, identify constraints addressed during the creation of the prototype, identify trade-offs made, and present the solution for peer review.