

BENWAY SCHOOL

Maker Space

Grades 9-12

Credits: 5



Benway School

Maker Space

Content Area: Technology

Unit Title: *Innovation & Design Process*

Grade Levels: 9-12

Unit Overview: In this unit students will use their knowledge of how various tools in our maker space work area to design, complete, and present their own project to the class.

Recommended Pacing: 6 weeks

Student Learning Objectives	NJSLS
Display an understanding of the stages of the design process	8.2.8.C.4
Apply the stages of the design process in the creation of authentic products	8.1.8.A.1 8.1.8.B.1 8.2.8.C.4
Display and understanding of how to utilize various technologies / tools in the design process	8.1.8.A.1 8.1.8.F.1
Use feedback, observation, and self-reflection to continually revise and improve a project	8.2.8.C.6
Design a unique product that either meets a need or address has a problem	8.2.12.C.7 8.2.8.D.1 8.2.8.D.2 8.2.8.D.3
Demonstrate a growth mindset by self reflecting on personal successes and failures that will enable students to meet project-based objectives	8.2.8.C.6 8.2.12.D.1
New Jersey Student Learning Standards	Progress Indicator
Create a group / class project that allows all students to participate and think out loud as we go through the design	8.2.8.C.4
As students work through each of their projects, they will keep a record of and reflect on the stages of the design process.	8.1.8.A.1 8.1.8.B.1 8.2.8.C.4
Students will be given an overview of small projects to complete using, but not limited to the following tools 3D printer, laser cutter / etcher, Wood / metal, tools	8.2.8.C.6
Students will be asked to design a product that meets a need or address a problem	8.2.12.C.7 8.2.8.D.1 8.2.8.D.2 8.2.8.D.3
American Association of School Librarians Standards (AASL) <i>(NJSLS standards should be applied, as needed, to connect to the general classroom instruction.)</i>	AASL
Follow ethical and legal guidelines in gathering and using information.	1.3.3
New Jersey Student Learning Standards 21st Century Life and Career Skills	Indicator

<i>(Additional standards should be applied, as needed, to enrich instruction and foster student achievement.)</i>	
Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.	9.2.8.B.3
Evaluate the impact of online activities and social media on employer decisions.	9.2.8.B.7
Career Ready Practices	
Indicator	
Act as a responsible and contributing citizen and employee.	CRP1
Attend to personal health and financial well-being.	CRP3
Communicate clearly and effectively and with reason.	CRP4
Consider the environmental, social and economic impacts of decisions.	CRP5
Demonstrate creativity and innovation.	CRP6
Employ valid and reliable research strategies.	CRP7
Utilize critical thinking to make sense of problems and persevere in solving them.	CRP8
Use technology to enhance productivity.	CRP11
Work productively in teams while using cultural global competence.	CRP12
Key Vocabulary Words	
Digital citizenship, identity theft, cyberbullying, media/social media, digital footprint, copyright, etiquette/netiquette	
Evidence of Learning	
<p>Suggested Assessments:</p> <ul style="list-style-type: none"> ● Oral participation and use of technology ● Group projects and papers ● Research projects and papers using technology ● Internet use ● Class participation ● Multimedia projects ● Group work ● Independent research 	
<p>Learning Activities:</p> <p>Introduction:</p> <ul style="list-style-type: none"> ● How to use 3D printers https://www.youtube.com/watch?v=3LBTKLsjHGQ ● How can 3D printers change our lives? ● What is a Laser Cutter / Etcher https://www.youtube.com/watch?v=kQBNtetMxDw ● Rework, Reuse, Remix: What rights do you have as a creator? <p>Additional Activities:</p> <ul style="list-style-type: none"> ● Whole class and small group discussions 	

<ul style="list-style-type: none"> ● Individual and group work ● Oral presentations ● Digital presentations 	
Instructional Materials: <ul style="list-style-type: none"> ● Smartboard ● Video selections ● Google Suite ● 3D Printer ● Laser Cutter / Etcher ● Desktop / Laptop 	
Teacher Resources: <ul style="list-style-type: none"> ● Tinkercad.com ● Tynker.com ● thingiverse.com ● Common Sense Education: Connecting Families resources https://www.commonsense.org/education/digital-citizenship 	
Modifications & Accommodations: <i>*Please note that the following modifications and accommodations vary from unit to unit, and may be implemented for any student who would benefit</i>	
<p style="text-align: center;"><u>Gifted and Talented</u> <i>(content, process, product, and learning environment)</i></p> <p>Extension Activities:</p> <ul style="list-style-type: none"> ● Conduct research and provide presentation of cultural topics ● Design surveys to generate and analyze data to be used in discussion. ● Authentic listening and reading sources that provide data and support for speaking and writing prompts ● Implement RAFT (role, audience, format, topic) activities as they pertain to the types/modes of communication ● Use of higher-level questioning techniques ● Provide assessments at a higher-level of thinking 	<p style="text-align: center;"><u>English Language Learners</u></p> <p>Modifications:</p> <ul style="list-style-type: none"> ● Modified assignments ● Native language translation (peer, online assistive technology, translation device, bilingual dictionary) ● Extended time for assignment completion as needed ● Highlight key vocabulary ● Use graphic organizers
<p style="text-align: center;"><u>Students with Disabilities</u> <i>(appropriate accommodations, instructional adaptation, and/or modifications as determined by the IEP)</i></p> <p>Modifications for Classroom:</p> <ul style="list-style-type: none"> ● Pair visual prompts with verbal presentations ● Ask students to restate information, directions, and assignments 	<p style="text-align: center;"><u>Students at Risk of School Failure</u></p> <p>Modifications for Classroom:</p> <ul style="list-style-type: none"> ● Pair visual prompts with verbal presentations ● Ask students to restate information, directions, and assignments ● Repetition and practice ● Model skills/techniques to be mastered ● Extended time to complete class work

- Repetition and practice
- Model skills/techniques to be mastered
- Extended time to complete class work
- Provide copy of class notes
- Preferential seating to be mutually determined by the student and teacher
- Student may request to use a computer to complete assignments
- Establish expectations for correct spelling on assignments
- Extra textbooks for home
- Student may request books on tape/CD/digital media, as available and appropriate
- Assign a peer helper in the class setting
- Provide oral reminders and check student work during independent work time
- Assist students with long and short term planning of assignments
- Encourage student to proofread assignments and tests
- Provide regular parent/school communication
- Teachers will check/sign student agenda daily
- Student requires use of other assistive technology device

Homework and Assignments:

- Extended time to complete assignments
- Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases.
- Provide the student with clearly stated (written) expectations and grading criteria for assignments.
- Implement RAFT (role, audience, format, topic) activities as they pertain to the types/modes of communication
- Continue to develop phrasing and fluency while reading aloud, as needed
- Encourage silent reading for short periods of time
- Use close reading strategies
- Continue to provide access to various genres
- Make available high interest, low readability texts for use during independent reading

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Modifications for Assessments:

- Extended time on classroom tests and quizzes
- Student may take/complete tests in an alternate setting as needed
- Restate, reread, and clarify directions/questions
- Distribute study guide for classroom tests
- Establish procedures for accommodations/modifications for assessments

- Use citing the text strategy to develop oral and written summarization skills
- Continue using marking the text strategy
- Write short essays using various supporting strategies such as marking the text, graphic organizers, citing text, and teacher-prompts
- Write routinely and engage in peer editing with teacher guidance

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