Upcycle

Content Area: **Technology**
Course(s):
Time Period: **September**
Length: **1**
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Unit Overview

In this unit students will become familiar with the term upcycling. As an environment that creates too much waste, upcycling is a creative way to reduce the amount of garbage we generate. Upcycling is taking something we normally recycle and transform it into something more valuable. Students will learn the difference from the normal concept of recycling and the now popular upcycling process and why there is a need for both in our ever changing world. Students will develop some designing, problem solving and team building skills by actually creating upcycled items during the unit. These items will be sold at an end of the year school event as a fundraiser to help support our school community organization called "The Fairy Godmother Program." This program helps our students and their families with clothing, perishable food items and pantry supplies throughout the school year. Our upcycling program is hoping to add small furniture and housewares to the growing list of needs.

Enduring Understandings

- Individual parts make up a system and rely on each other to work properly.
- Technology products and systems are made up of resources.
- The design process is fundamental to technology and engineering.

Essential Questions

- How does a broken part affect the use of a toy, piece of furniture or tool?
- What are resources?
- How does disposal of material affect the world?

Student Learning Objectives (SLOs)

- Students will demonstrate the knowledge of a real world problem using digital tools.
- Synthesize and publish information about a local event using social media or school website.
- Understand appropriate uses for social media and the negative consequences of misuse.
- Demonstrate the application of appropriate citations to digital content.
- Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem.
- Examine a system, consider how each part relates to other parts and discuss a part to redesign to improve the system.
- Evaluate the history and impact of sustainability on the development of a designed product or system over time and present.
- Research and analyze the ethical issues of a product or system on the environment.
- Analyze the historical impact of waste and demonstrate how a product is upcycled, reused or remanufactured into a new product.
- Explain how different teams can contribute to the overall design of a product.
- The role of troubleshooting, research, and development, invention and innovation and experimentation in problem solving.

TECH.8.1.8.B	Creativity and Innovation: Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.
TECH.8.1.8.B.1	Synthesize and publish information about a local or global issue or event (ex. telecollaborative project, blog, school web).
TECH.8.1.8.E	Research and Information Fluency: Students apply digital tools to gather, evaluate, and use information.
TECH.8.1.8.E.CS2	Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media.
TECH.9.4.8.IML.3	Create a digital visualization that effectively communicates a data set using formatting techniques such as form, position, size, color, movement, and spatial grouping (e.g., 6.SP.B.4, 7.SP.B.8b).
TECH.9.4.8.IML.5	Analyze and interpret local or public data sets to summarize and effectively communicate the data.
	Digital tools make it possible to analyze and interpret data, including text, images, and sound. These tools allow for broad concepts and data to be more effectively communicated.

Standards/Indicators

TECH.8.2.8	Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.
TECH.8.2.8.A	The Nature of Technology: Creativity and Innovation: Technology systems impact every aspect of the world in which we live.
TECH.8.2.8.A.1	Research a product that was designed for a specific demand and identify how the product has changed to meet new demands (i.e., telephone for communication - smart phone for mobility needs).
TECH.8.2.8.A.1	Research a product that was designed for a specific demand and identify how the product has changed to meet new demands (i.e. telephone for communication-smart phone for mobility needs).
TECH.8.2.8.A.2	Examine a system, consider how each part relates to other parts, and discuss a part to redesign to improve the system.
TECH.8.2.8.A.2	Examine a system, consider how each part relates to other parts, and discuss a part to redesign to improve the system.
TECH.8.2.8.A.3	Investigate a malfunction in any part of a system and identify its impacts.
TECH.8.2.8.A.3	Investigate a malfunction in any part of a system and identify its impacts.
TECH.8.2.8.A.4	Redesign an existing product that impacts the environment to lessen its impact(s) on the environment.
TECH.8.2.8.A.5	Describe how resources such as material, energy, information, time, tools, people, and capital contribute to a technological product or system.
TECH.8.2.8.A.5	Describe how resources such as material, energy, information, time, tools, people, and capital contribute to a technological product or system.
TECH.8.2.8.B	Technology and Society: Knowledge and understanding of human, cultural and society values are fundamental when designing technology systems and products in the global society.
TECH.8.2.8.B.1	Evaluate the history and impact of sustainability on the development of a designed product or system over time and present results to peers.
TECH.8.2.8.B.2	Identify the desired and undesired consequences from the use of a product or system.
TECH.8.2.8.B.3	Research and analyze the ethical issues of a product or system on the environment and report findings for review by peers and /or experts.
TECH.8.2.8.B.4	Research examples of how humans can devise technologies to reduce the negative consequences of other technologies and present your findings.
TECH.8.2.8.B.5	Identify new technologies resulting from the demands, values, and interests of individuals, businesses, industries and societies.
TECH.8.2.8.B.6	Compare and contrast the different types of intellectual property including copyrights, patents and trademarks.
TECH.8.2.8.B.7	Analyze the historical impact of waste and demonstrate how a product is up cycled, reused or remanufactured into a new product.
TECH.8.2.8.B.CS1	The cultural, social, economic and political effects of technology.
TECH.8.2.8.B.CS2	The effects of technology on the environment.
TECH.8.2.8.B.CS3	The role of society in the development and use of technology.

TECH.8.2.8.B.CS4	The influence of technology on history.
TECH.8.2.8.C	Design: The design process is a systematic approach to solving problems.
TECH.8.2.8.C.1	Explain how different teams/groups can contribute to the overall design of a product.
TECH.8.2.8.C.2	Explain the need for optimization in a design process.
TECH.8.2.8.C.3	Evaluate the function, value, and aesthetics of a technological product or system, from the perspective of the user and the producer.
TECH.8.2.8.C.4	Identify the steps in the design process that would be used to solve a designated problem.
TECH.8.2.8.C.7	Collaborate with peers and experts in the field to research and develop a product using the design process, data analysis and trends, and maintain a design log with annotated sketches to record the developmental cycle.
TECH.8.2.8.C.8	Develop a proposal for a chosen solution that include models (physical, graphical or mathematical) to communicate the solution to peers.
TECH.8.2.8.C.5a	Explain the interdependence of a subsystem that operates as part of a system.
TECH.8.2.8.C.5b	Create a technical sketch of a product with materials and measurements labeled.
TECH.8.2.8.C.CS1	The attributes of design.
TECH.8.2.8.C.CS2	The application of engineering design.
TECH.8.2.8.C.CS3	The role of troubleshooting, research and development, invention and innovation and experimentation in problem solving.

Lesson Titles

- The Product
- The System and the Parts
- The Malfunction of the System
- The Resources
- Impact of Technology, Culture and Other Effects on the Product or System
- Creating a Blueprint
- Working Together Successfully

Inter-Disciplinary Connections

LA.RST.6-8.1	Cite specific textual evidence to support analysis of science and technical texts.
LA.RST.6-8.2	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
LA.RST.6-8.3	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
LA.RST.6-8.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.
LA.RST.6-8.7	Integrate quantitative or technical information expressed in words in a text with a version

	of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
LA.RST.6-8.8	Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.
LA.WHST.6-8.2	Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.
MA.7.G.A	Draw, construct, and describe geometrical figures and describe the relationships between them.
MA.7.G.B	Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.
LA.WHST.6-8.4	Produce clear and coherent writing in which the development, organization, voice, and style are appropriate to task, purpose, and audience.
LA.WHST.6-8.6	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.
LA.WHST.6-8.7	Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.
	Apply scientific principles to design an object, tool, process or system.
	Human activities have significantly altered the biosphere, sometimes damaging or destroying natural habitats and causing the extinction of other species. But changes to Earth's environments can have different impacts (negative and positive) for different living things.
	Typically, as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise.
	Human activities, such as the release of greenhouse gases from burning fossil fuels, are major factors in the current rise in Earth's mean surface temperature (global warming). Reducing the level of climate change and reducing human vulnerability to whatever climate changes do occur depend on the understanding of climate science, engineering capabilities, and other kinds of knowledge, such as understanding of human behavior and on applying that knowledge wisely in decisions and activities.

Warm-Up

- You-tube Video
- Keyboarding Review
- Student Feedback Journal Entry
- Project Feedback Form (for teacher data)
- Project Feedback Form (for student data)

Anticipatory Set

- Sample Teacher Project
- Review of Background Information

- You-tube Video

Equity Considerations

LGBTQ and Disabilities Mandate

Topic: Diversity and Inclusion in Upcycled Designs

- Research and discuss how upcycling can be used to create accessible and inclusive products for people with disabilities

Topic: Promoting Social Responsibility Through Upcycling:

- Use the upcycling project as an opportunity to highlight the social responsibility aspect of sustainability.
- Discuss the impact of consumerism and waste generation on marginalized communities.

Topic: Upcycling as a Form of Expression:

- Encourage students to use their upcycled creations as a form of self-expression and to celebrate their unique identities.

National Disability Rights Network: https://www.ndrn.org/

The Arc: https://thearc.org/

Disability Rights Education & Defense Fund (DREDF): https://dredf.org/

Human Rights Campaign: https://www.hrc.org/about

GLAAD: https://glaad.org/

Climate Change

Asian American Pacific Islander

Holocaust Mandate

Amistad Mandate

Instructional Strategies, Learning Activities, and Levels of Blooms/DOK

Strategies

- Active participation
- LML
- Benchmark testing
- Checking for understanding
- Classroom routine
- Connect to prior knowledge/learning
- Cooperative learning
- Giving student examples
- Graphic organizers
- Demonstration
- Displaying student work
- Feedback to student
- Grouping students
- Guided practice
- Hands-on activity
- Independent practice
- Praise and Recognition
- Question strategies
- Student demonstrations to class
- Students making predictions
- Use of rubrics
- Use of technology

Modifications

ELL Modifications

Digital translators

- Students will be encouraged to use a translator as needed.

Group students

- At times allow the student to select a group that would make them feel confident to interact and play a role in the planning of the assignment.

Create planned opportunities for interaction between individuals in the classroom: skits, cooperative and collaborative learning, student generated stories based on personal experience

- Allow the assignment to include other cultures to allow the student a chance to show their cultural knowledge.

Repeat, reword, clarify

- Student will have the opportunity to receive directions in different forms such as verbal, written and 1:1 with teacher during teacher observation.

Intentional scheduling/grouping with student/teacher who speaks the same language if possible

- During the semester student will be grouped with other students to encourage growth, confidence and success.

Be flexible with time frames and deadlines

- Student will understand that time frames and deadlines are important however, extra time will be provided if the instructor deems it is warranted.

Offer resources for specific topics in primary language (Youtube web resources)

- Encourage the student to use sources that will provide information needed for the assignment in either language and offer sources to the student if necessary.

504 and IEP Accommodations & Modifications

Testing modifications:

Rewording questions so that there are not higher level vocabulary within the question (you are testing for understanding of the content not the ability to understand the question)

- Assess the students on the final project and the thought process, creativity and planning use the by student and their ability.
- Students will be able to select a project within their educational comfort zone, yet still demonstrate mastery of the content.

Less questions per page (so not visually overwhelming)

- Large assignments will be broken down into steps to create small goals for the student to complete with confidence.

Allowing student to correct mistakes or answer wrong questions correctly for additional credit if failed the first test (another way to re-teach material)

- Allow the students to evaluate their work and encourage them to make corrections, showing understanding of the design process.
- Emphasize the learning process and learning from mistakes and failures to improve future projects.
- Understanding that failing is O.K.

Instructional modifications/accommodations:

Modeling and showing lots of examples

- As the students develop their learning projects, they will be given

opportunities to research, cooperatively and individually, examples for them to model.
- The teacher shall maintain an environment that students can explore, grow and create.

Allowing co-teaching with general education and special education teachers in the same classroom so that the special education teacher can re-teach students with special needs in a different way in a smaller group (pulled to the side)

- Allowing the student to benefit from more than one teacher and personality will encourage the child to see how people learn, create and interactive differently. Showing them we all learn at different pace, in different ways will help them build confidence in themselves.

Direct teaching and/or assistance for organization, social skills/peer interactions

- Working 1:1 with a student can provide the student time to share concerns about their assignment, question the teacher privately and provide praise.

Breaking larger assignments/projects into shorter tasks with clear deadlines for each section

- Students will be encourage to look at the whole project idea, but the student will understand the project components will be broken down into steps to make for easier understanding and allow the student to focus on the creativity and effort required for each step.

Gifted and Talented Modifications

Allow student generated reports of structured learning experiences as alternate evidence of 21st Century Skills.

- G&T students can keep a log of their learning experiences (i.e. Google lab sheets.). Emphasis will be placed on how they process mistakes and failures.

Peer leadership or mentoring.

- G&T students will be given a role to lead groups and mentor struggling

students. The instructor will be mindful of interpersonal interactions between students.

Additional reinforcement activities soliciting a deeper understanding of curriculum.

- G&T students will be encouraged to synthesize information to draw conclusions about machines, products, systems or formats. They will apply their conclusions to improve, create or develop and new application for the products they were previously working on.

Closure

- Exit ticket
- Journal entry
- Teacher observation
- Hands-on activity "Show Me"
- 3-2-1
- Pair/Share
- Doodles or Gallery Walk
- What's Inside

Formative Assessment

- Benchmark Assessment
- Blueprint Sketches
- Research Information Sheets
- Design Idea Sheets

Summative Assessment

- Upcycled project
- Piece Research/Design Presentation

Benchmark Assessments

Skills-based assessment

Reading response

Writing prompt

Lab practical

Alternative Assessments

Performance tasks

Project-based assignments

Problem-based assignments

Presentations

Reflective pieces

Concept maps

Case-based scenarios

Portfolios

Resources & Materials

- Software (Google Docs and Slides, MS Publisher and PowerPoint, Illustrator and Internet browsers)
- Digital cameras and camcorders
- Small tools (screw drivers, staplers, sanders, etc.)
- Paint, Stain, Fabric, Glue
- Social media (Facebook, Instagram, Twitter, etsy and Pinterest)

- Professional Development, Webinars, and Workshops

Technology

- Classroom computers will have relevant software uploaded