

Middle-level CTE Learning Experience Title: Recycling Systems Educator: McKenzie Dillman, Shenendehowa CSD Length of Lesson: 16 days (40 minute periods) Grade Level: 6-8	CTE Area: Technology and Engineering education CTE Theme: Financial and Consumer Literacy CTE Content: Technology and Society Date Created: September 9, 2019
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PLANNING	
Curriculum Goal	Students develop a recycling program for the school that identifies the costs and benefits of recycled materials. Students identify a system for separating and sorting the materials and evaluate the value of the relative materials, including deposits on drink containers or selling scrap metals. Students will evaluate the costs associated with recycling including storage, transporting, and disposal of materials that could be recycled but are not.
Essential Question(s)	<p>What knowledge and skills are necessary to demonstrate an introductory understanding of how money can be managed and how individuals can create and achieve financial goals while managing financial challenges?</p> <p>What do students need to understand about how technology impacts the social, cultural, and environmental contexts of our ever-changing world?</p>
National Standards	<p>Common Career Technical Core Standards Career Ready Practices - www.careertech.org/career-ready-practices</p> <ol style="list-style-type: none"> 1. Act as a responsible and contributing citizen and employee 2. Apply appropriate and academic and technical skills 5. Consider environmental, social, and economic impacts of decisions 6. Demonstrate creativity and innovation 7. Employ valid and reliable research strategies 8. Utilize critical thinking to make sense of problems and persevere in solving them 9. Model integrity, ethical leadership, and effective management 12. Work productively in teams while using cultural global competence <p>International Technology and Engineering Educators Association Standards for Technological Literacy https://www.iteea.org/39197.aspx</p> <p>The Nature of Technology</p> <ol style="list-style-type: none"> 1. Students will develop an understanding of the characteristics and scope of technology <p>Technology and Society</p> <ol style="list-style-type: none"> 5. Students will develop an understanding of the effect of technology on the environment 6. Students will develop an understanding of the role of society in the development and use of technology <p>The Designed World</p> <ol style="list-style-type: none"> 19. Students will develop an understanding of and be able to select and use manufacturing technologies

<p>NYS Standards</p>	<p>New York State Career Development and Occupational Studies (CDOS) Standards http://www.p12.nysed.gov/cte/</p> <p>Standard 1: Career Development Students will be knowledgeable about the world of work, explore career options, and relate personal skills, aptitudes, and abilities to future career decisions.</p> <p>Standard 2: Integrated Learning Students will demonstrate how academic knowledge and skills are applied in the workplace and other settings.</p> <p>Standard 3a: Universal Foundation Skills Students will demonstrate mastery of the foundation skills and competencies essential for success in the workplace.</p>
<p>Learning Objectives</p>	<p>Financial and Consumer Literacy 4. Buying Goods and Services Students will</p> <ul style="list-style-type: none"> a) Define the term "consumer" and describe the role of the consumer in the economy b) Distinguish between needs, wants, values, and goals and tell how each impacts spending and savings decisions e) Explain the influence of peers, advertising, technology, and the economy on consumer decisions f) Apply a decision-making model to maximize consumer satisfaction when purchasing goods and services g) Compare local, national, and global resources for obtaining goods and services h) Analyze consumer rights, responsibilities, and protections provided by local, state, federal, and global laws and policies <p>Technology and Society 1. The Cultural, Social, Economic, and Political Effects of Technology Students will</p> <ul style="list-style-type: none"> a) Describe how the use of technology affects humans' safety, comfort, choices, and attitudes about the development and use of technologies. b) Define how our choices to use products and systems can result in desirable and undesirable consequences. c) Describe and discuss ethical issues associated with the selection and use of technologies. <p>2.The Effects of Technology on the Environment Students will</p> <ul style="list-style-type: none"> a) Identify social, health, and environmental issues resulting from waste produced by technological systems. c) Describe how technology is applied toward breaking down waste produced by technological systems. d) Evaluate how using technological developments causes competition between economic and environmental concerns <p>4.The Influence of Technology and History Students will</p> <ul style="list-style-type: none"> b) Describe how the specialization of products and systems has led to technological improvements

Vocabulary	Academic Survey, Proposal, Research, Cost/Benefit Analysis, System, Landfill	Content Consumer, Recycling, Regulation, Investing, Innovation, Virgin Material, Post-Consumer, Degradation	
Materials and Resources	Assorted consumer materials (Day 1) Devices with internet connection and Google Drive (Day 1 - 15) Video recording device (Day 5) Recording device (Day 7 - 8)		
INSTRUCTION	What will the teacher do?	What will the students do?	How much time for each activity?
Pre-assessment	Day 1 Give students products to examine. Have students answered questions about the products. Guide students to complete product analysis chart	Day 1 Study a range of consumer products. Answer questions: What material(s) is this product made from? Do you think the product was made from recycled materials? Could it be? What will happen to this product at the end of its life cycle? Can any part of this product be recycled? How long do you think this product was meant to last? Discuss with neighbors. Complete product analysis chart	20 minutes
Do-now/Hook	Day1 (cont.) Invite a member of the school maintenance staff to come into the classroom and share some information about the school's waste management system. Have students record key information using a guided note sheet or graphic organizer.	Day 1 (cont.) Listen to the speaker, record notes, ask questions when appropriate. Demonstrate active listening skills.	20 minutes
Procedure for Instruction/ Learning Activities	Day 2-3 Divide students into small groups (about 4 per group). Assign or allow students to select classes of materials to investigate (ex: plastic, paper, cardboard, food waste, glass, metal, returnable containers, printer cartridges, electronics, etc.) Have students in each group research recycling methods for their assigned material class. They gather information such as	Day 2 - 3 Work in small groups to find answers to guiding questions about assigned material class. Demonstrate effective team dynamics. Allocate tasks appropriately. Effectively manage time.	40min x 2 days 60-80 minutes

	<p>recycling methods, costs, savings to individuals or manufacturers, environmental pros/cons, and local recycling statistics from recent years.</p> <p>Day 3-4 Guide groups as they prepare a slideshow, video, flyer, or infographic to present their findings to their classmates.</p> <p>Day 5 Facilitate as teams present their findings to the class. Record presentations on video for later critique.</p> <p>Explain “need to know” questions homework exercise. Explain that students should think about questions they have about recycling in their own local community.</p> <p>Day 6 Discuss “need to know” questions with class. Work with students to sort list into questions for: Teachers, Administrators, Students, Maintenance staff, town waste management department. Assign students to interview people from each group.</p> <p>Introduce students to a digital survey tool such as Google Forms or Survey Monkey. Teach best</p>	<p>Day 3 - 4 Work collaboratively on a presentation to be presented to the class. Each team member should be prepared to report on a portion of the findings.</p> <p>Day 5 Presenting finding and presentation using effective communication skills to clearly relay their findings to the rest of the class. Listeners demonstrate active listening skills and ask questions when appropriate.</p> <p>Homework: Compile a list of “need to know” questions. Questions they have about recycling in their local community and school.</p> <p>Day 6 Share list of “need to know” questions. Help refine and sort questions into groups.</p> <p>Choose an adults to interview/survey about waste management.</p> <p>Use survey creation website to develop a survey from the “need to know” questions. Create a list of adults to contact regarding your material class.</p>	<p>40min x 2 days 60-80 minutes</p> <p>40 minutes + Homework</p> <p>20 minutes</p> <p>20 minutes to develop survey</p>
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	<p>practices for creating a survey, and how to tailor survey questions to the specific group of adults to which the students are assigned. See example survey below</p> <p>Help students to use survey tools and create their surveys. Explain homework, teach how to create emails if needed.</p> <p>Day 7 - 8 Teacher describes the elements of a project proposal that presents a strategy for improvement of waste management of your assigned material class, with special emphasis on cost/benefit analysis.</p> <p>Teacher will illustrate some effective communication techniques for upcoming interviews, such as active listening, note taking, and clarifying or follow-up questions. Ex: "Can you tell me a little more about that?" or "What do you mean by that?" or "I'm not familiar with the term _____, can you explain that in a little more detail?"</p> <p>Provide guidance and answer questions for students having difficulty interviewing adults. Monitor student progress as they return to class.</p>	<p>The goal is to develop an understanding of current waste management practices, recycling habits, and potential areas for improvement for your assigned material class.</p> <p>Homework: Write an email to all of the adults on your list, requesting a time during which they might be willing to meet for an interview. Attach a copy of the electronic survey for anyone who is unable or unwilling to be interviewed, and CC the technology teacher as homework submission.</p> <p>Day 7 - 8 Actively listen to the teacher's explaining of the project proposal.</p> <p>Listen to teachers strategies for interviewing. Pair off to practice asking quality interview questions and appropriate follow-up questions. Review and practice personal interview scripts in-class.</p> <p>When it is time to interview an adult, report to class, then travel around the building to conduct interviews with adults about their recycling habits, opinions, and current practices. Record interviews with hand-written notes or audio recording device. Practice responsible, ethical behavior while</p>	<p>Homework: Emails should be sent overnight Interviews should be set up for class time on Day 8 if possible.</p> <p>40 min x 2 days</p>
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	<p>Day 9-10 Guide students in developing proposals based on the information gathered through their surveys and interviews. Monitor group progress, and provide support for teams that need help staying on track.</p> <p>Observe and log group dynamics, effective time management strategies, roles of students within groups, time on task, communication strategies, cooperation, etc.</p> <p>Day 11 Teacher will play recordings of Day 5 presentations to the class, pausing as necessary to comment on good/bad examples. Teacher should ask students for constructive criticism on presentations in order to point out areas for improvement prior to final presentations.</p> <p>Day 12-14 Teams work collaboratively to refine their project proposal based on feedback from teacher. They develop a final presentation for their proposal in slideshow or video format to be presented to building</p>	<p>traveling through the hallways and meeting with adults. When finished, return to class to upload a recording or transcription of their interview to a shared folder or cloud drive for team members to access/reference.</p> <p>Day 9 - 10 Teams carefully consider what they have learned about recycling methods and current practices. Develop a proposal for improvements on your assigned material class, which could be implemented within the school.</p> <p>Work collaboratively with the team to draft a proposal document based on information gathered through research, surveys, and interviews. Teams demonstrate effective group dynamics. Turn in your proposal for review at the end of Day 10.</p> <p>Day 11 Students watch recorded presentations and offer thoughtful respectful, constructive criticism on their own presentation, as well as others.</p> <p>Day 12 - 14 With team, refine project proposals and create final presentations. Demonstrate effective group dynamics such as task allocation, time management, organization, and conflict resolution.</p>	<p>40 min x 2 days</p> <p>40 min</p> <p>40 min x 3 days</p>
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	<p>administrators at the end of the week. They script and rehearse their new presentation, keeping in mind feedback from their Day 5 presentation.</p> <p>Day 15 Teacher facilitates as teams present final proposals. Teacher keeps track of time and keeps teams adherent to schedule. Teacher records presentations on video for later review.</p> <p>Day 16 (Closure) Teacher guides and monitors students as they answer some of the essential questions to reflect on their learning. What do you now understand about how technology impacts the social, cultural, and environmental contexts of our ever-changing world? How did your presentation, interview and communication skills improve during this project? How can individuals create and achieve financial goals while managing financial challenges?</p>	<p>Day 15 Teams present their project proposals to the class, as well as members of the school community (administrators, maintenance staff, teachers, etc.)</p> <p>Day 16 Students answer some of the essential questions to reflect on their learning. What do you now understand about how technology impacts the social, cultural, and environmental contexts of our ever-changing world? How did your presentation, interview and communication skills improve during this project? How can individuals create and achieve financial goals while managing financial challenges?</p>	<p>40 minutes</p> <p>40min</p>
<p>Differentiation</p>	<p>Students will be grouped by their abilities and interests. Teacher will provide scaffolded support where needed. Students who have physical disabilities will be accommodated for. Students who are meeting all of the expectations will be challenged to go above and beyond.</p>		
<p>Closure</p>	<p>In addition to the final presentation, students answer some of the essential questions to reflect on their learning. What do you now understand about how technology impacts the social, cultural, and environmental contexts of our ever-changing world? How did your presentation, interview and communication skills improve during this project?</p>		

ASSESSMENT	
College, Career, and Life Readiness Skills	See below Based on Middle-level Life/Career Rubrics available at https://nycotecenter.org/middle-level-life-career-rubric-database/rubrics

Performance Measure	Exemplary	Proficient	Developing	Beginning
Listens and Cooperates With Team Members	Consistently listens to others and their ideas, helps the team reach its full potential	Listens to others' points of view and makes a definite effort to understand their ideas.	Sometimes listens to others, but often assumes others' ideas will not work. Tries to work well with the team.	Does not listen to the group's opinions and ideas, wants things done own way.
Works Effectively with Diverse Teams	Always listens to, shares with, and supports the efforts of others. Uses respectful and appropriate statements, responses, and body language.	Listens to, shares with, and supports others. Statements and responses are respectful, and appropriate body language is exhibited.	Most statements, responses, and body language are respectful, with only an occasional negative tone. It does not always listen to, share with, or support the efforts of others.	Statements, responses, and/or body language are not respectful. Rarely listens to, shares with, and supports the efforts of others.
Fulfills Roles Responsibly	When given any role in group efforts, it consistently exceeds that role responsibility.	Completes any given role responsibility in a group effort to the best of ability.	Usually fulfills assigned roles, but works better in preferred roles.	Fails to fulfill assigned roles.
Compromises to Accomplish Goals	Always demonstrates the ability to compromise, allowing the group to meet its full potential.	Is willing to compromise with a group to accomplish a common goal.	Attempts to compromise to accomplish a common goal, but sometimes interferes with a group meeting its full potential.	Typically unwilling to compromise with the group to accomplish a common goal often interferes with a group meeting its full potential.
Shares Responsibility	Motivates members to share contributions equally by valuing all members' ideas and contributions.	Participates in and contributes to the group's work. Values all members' ideas and contributions.	Attempts to share the responsibility of the group's work, but ends up completing little of the work by disregarding the input of others	Does very little of the group's work, does not share ideas or respect others' ideas.

Resolves Conflicts	Resolves conflicts effectively and independently in socially acceptable ways and uses a wide variety of appropriate strategies.	Resolves conflicts independently when they occur and uses a variety of strategies to resolve them appropriately.	Has limited strategies to resolve conflicts appropriately but does so with assistance.	It finds it difficult to resolve conflicts and is frequently in conflict.
Listens and Speaks when Appropriate	Engages in conversations/ discussions and consistently understands when it is appropriate to speak and when it is appropriate to listen.	Engages in conversations/ discussions and understands when it is appropriate to speak and when it is appropriate to listen.	At times, it speaks when it is not appropriate and does not listen when it is appropriate.	Often needs to be reminded of appropriate times to speak and appropriate times to listen.
Listens to Determine Meaning	Thoughtfully and consistently listens to and reflects on the information and intentions of the message.	Effectively listens to and reflects on the information and intentions of the message.	Attempts to listen to the message and reflect on its meaning but misses key information or intentions of the message.	It does not listen carefully to the message and demonstrates misunderstanding by not reflecting on the meaning.
Asks Clarifying Questions	Effectively identifies and asks significant questions that clarify various points of view and lead to a better solution.	Identifies and asks significant questions that clarify various points of view and lead to a better solution.	Asks questions for the purpose of reaching a better solution, but fails to consider other points of view.	It does not attempt to make inquiries to understand other points of view for the purpose of reaching a better solution.
Informs, Instructs, Motivates, and Persuades	Effectively uses communication to inform, instruct, motivate, and persuade.	Uses communication to inform, instruct, motivate, and persuade.	Communicates to inform or instruct.	Communicates only to inform and not for other purposes
Contributes New Ideas new	Appropriately contributes new and innovative ideas based on reliable resources.	It often contributes and innovative ideas based on known and reliable resources and skills.	Contributes some new and innovative ideas based on known resources and skills.	Rarely contributes new ideas as skills and resources are not developed enough.
Refines and Evaluates Ideas to Improve	Does extensive reflection on own ideas and incorporates changes in creative efforts.	Reflects on own ideas and incorporates changes in creative efforts to improve the value of the work.	Reflects on own ideas and attempts to incorporate changes in creative efforts to improve the value of the work.	Has difficulty reflecting on their own ideas.

Participates Actively	Consistently provides useful ideas when participating in group and classroom discussions.	It provides useful ideas when participating in group and classroom discussions.	Sometimes participates in group and classroom discussions.	Does not participate in group or classroom discussions
Accesses Information	Locates information efficiently from reliable sources. Uses innovative strategies to access needed information	Considers more than one strategy or tool to locate information, research is complete and accurate.	Accesses information from multiple sources and recognizes when information is incomplete but fails to improve research.	Conducts simple searches for information which are often inaccurate or incomplete.
Uses Technology to Locate and Evaluate Information	Effectively and consistently uses multiple technology tools to collect, organize, evaluate, and/or communicate information.	Uses technology effectively as a tool to collect, organize, evaluate, and/or communicate information.	Uses popular technology tools to collect and/or communicate information.	Attempts to use technology to collect and/or communicate information are ineffective.
Interprets Information and Draws Conclusions	Is able to look at complex information and successfully draw conclusions and apply them to the situation.	Is able to look at information and successfully draw conclusions.	Looks at information and sometimes draws conclusions.	Looks at information but rarely draws a conclusion
Uses Media Creation Tools and Conventions	Creates products using advanced digital tools to compose, illustrate, and communicate original ideas or research.	Creates products using digital tools to compose, illustrate, and communicate information.	Attempts to create a product using digital tools to compose, illustrate, and communicate information but do not complete it	It does not understand how to utilize digital tools.
Takes Initiative	Monitors, defines, prioritizes, and complete tasks in a variety of conditions and without oversight.	Monitors, defines, prioritizes, and complete tasks without direct oversight.	Attempts to monitor, define, prioritize, and complete tasks without direct oversight.	Is unable to monitor, define, prioritize, and complete tasks without direct oversight.
Contributes to the Success of the Group	Consistently requests help at appropriate times and when needed (e.g., knows when to seek help from others or supervisor).	Usually, requests help when needed (e.g., asking questions after consulting manuals on policies and procedures, knowing when to seek help from others or supervisor).	Sometimes requests help when needed (e.g., asks questions before consulting manuals on policies and procedures, sometimes seeks help from others or supervisor).	Does not request help when needed (e.g., doesn't ask questions of others or supervisor).

Uses Interpersonal Skills to Guide Others	Effectively communicates and motivates others to solve group problems.	Frequently communicates and motivates others to solve group problems.	Attempts, but fails to communicate effectively to solve a problem or motivate others.	Shows little interest in working with others to solve problems
Analyzes Critical Information	Thoroughly evaluates the reliability of the source and the information researched using internal and external validation.	Thoroughly evaluate information researched using internal and external validation.	Evaluates information researched but not thoroughly.	Does not evaluate information
Acts Responsibly in the Interests of Others	Contributes extensively to a community organization or event, thoughtfully reflects on the importance of own actions within the community.	Contributes to a community organization or event and reflects on the importance of personal involvement within the community.	Participates in, but does not contribute to, a community organization or event and attempts to reflect on personal involvement within the community.	It does not contribute to a community organization or event or reflects on the importance of involvement within the community.
Seeks to Improve	Demonstrates strong self-motivation to perform better in all future tasks.	Usually shows commitment to self-improvement.	Needs regular reminders and support to maintain interest in self-improvement.	Shows little interest in or optimism to improve.
Works Independently	Shows a strong ability to work independently with no supervision.	Works independently and seeks assistance when needed.	Usually works independently with some supervision and support.	Needs close supervision to complete work.
Manages Time to Complete Tasks by Deadline	Completes work ahead of schedule by creating a plan to finish early.	Completes work on time by using time management skills.	Completes work on time with reminders and supervision.	Rarely completes work on time, fails to use time management skills
Responds Appropriately to Supervision	Consistently accepts feedback from the supervisor and makes adjustments as suggested.	Listens to feedback from the supervisor and makes adjustments as suggested.	Listens to feedback from the supervisor and attempts to make adjustments as suggested.	Rarely listens to feedback from a supervisor or fails to make adjustments as suggested
Takes Responsibility for Learning	Consistently and accurately completes learning tasks and takes responsibility for work.	Usually completes learning tasks and takes responsibility for work not completed.	Needs frequent prompting to complete learning tasks.	Acts as if learning is something to be endured and barely complies with minimal requirements.

<p>Is Accountable for Results Contributes to the Well-being of Community</p>	<p>Always accepts responsibility for results, sees an opportunity to learn from failures. He is a strong advocate for the community and always acts in a manner that benefits the community.</p>	<p>Accepts responsibility for results, does not use excuses or blame others. Understands the responsibility of the individual to the community and acts in a manner that benefits the community.</p>	<p>Takes limited responsibility for incomplete work or poor results. Offers excuses. It usually considers the well-being of the community even if occasionally acts in self-interest.</p>	<p>She/He does not take responsibility for poor work. Uses excuses or blames others. Favors self-interest over the well-being of the community</p>
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