Middle-level CTE Learning Experience Title: Product Lifecycles (Packaging Decisions) Educator: Denise Paley, Marion CSD Length of Lesson: 9 days (40 minute periods) Grade Level: 7/8	CTE Area: Family and Consumer Sciences CTE Theme: Sustainability CTE Content: Environmental Design and Management Date Created: June 2019

PLANNING	
Curriculum Goal	Students will identify a commonly used household item and investigate the full product lifecycle. They will include the source of the materials used to make the product, the useable life of the product, and ways the product can be safely recycled or repurposed for a new use. Students will discuss the impacts on community resources from initial creation to disposal. Sustainability refers to the rate of use of resources such that consumption can continue without damaging the environment. Students will examine the resources they use, how they use them, and ways to conserve and preserve resources for future generations. This lesson explores packaging decisions based on sustainability criterion.
Essential Question(s)	What knowledge and skills are necessary to evaluate the long-term effects of personal practices on the environment and to demonstrate introductory understanding of how to use and conserve resources to meet human needs while minimizing harm to the environment? Using the guidelines of Sustainability, how can I decide what to purchase based on the package of the products?
National Standards	Common Career Technical Core Standards https://www.careertech.org/career-ready-practices Career Ready Practices 1. Act as a responsible and contributing citizen and employee 5. Consider environmental, social, and economic impacts of decisions 8. Utilize critical thinking to make sense of problems and persevere in solving them 9. Model integrity, ethical leadership, and effective management National Family and Consumer Sciences Standards https://www.nasafacs.org/national-standards-and-competencies.html 3.0 Consumer Services Integrate knowledge, skills, and practices needed for a career in consumer services 3.4Analyze resource consumption for conservation and waste management practices 3.4.1 Investigate sources and types of residential and commercial energy, water policy and usage, waste disposal, and pollution issues 3.4.2 Evaluate local, state, and national consumer programs and services, both private and government, to recycle and conserve energy and environmental resources 3.4.3 Explore a variety of strategies and practices to conserve energy and reduce waste 3.4.4 Examine waste management issues and local, national, international, and global issues

NYS Standards	New York State Career Development and Occupational Studies (CDOS) Standards Intermediate Level http://www.p12.nysed.gov/cte/ 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. Standard 2: Integrated Learning Students will demonstrate how academic knowledge and skills are applied in the workplace and other settings. Standard 3a: Universal Foundation Skills Students will demonstrate mastery of the foundation skills and competencies essential for success in the workplace. NYS Learning Standards for Family and Consumer Sciences Intermediate Level Standard 2: Safe and Healthy Environment Students will acquire the knowledge and ability necessary to create and maintain a safe and healthy environment, Standard 3: Resource Management Students will understand and can manage their personal and community resources
Learning Objectives	Sustainability 1. Resources Students will a) Define "sustainability" as it applies to resource use b) Explain how sustainability can be a factor in decision making d) Explain factors to consider when evaluating environmental implications of decisions g) Practice making decisions that show consideration for sustainability of resources in a variety of classroom applications 2.Environmental Management Students will e) Explain factors to consider when assessing the environmental impact of purchasing 3. Energy Conservation Students will c) Understand and explain how individuals can limit the use of nonrenewable resources by reducing, reusing, and recycling h) Practice energy conservation through a variety of classroom applications 4. Careers Related to Sustainability Students will a) Investigate knowledge, skills, and practices needed for careers related to sustainability or for employment in settings that utilize sustainable practices

	Environmental Design and Management 1. Healthy, Safe, Sustainable Living Spaces Students will a) Recognize that family, school, work, and community settings are all part of the individual's broader living space d) Investigate ways to conserve natural resources in family, school, work, and community settings		
Vocabulary	Academic Impact, Concentrated, Parking Lot, Thought Partner, Consensus, Observation, Opinion	Content Sustainability, Landfill, Recycling, Renewable, Non-renewable, Fossil fuel, Post-consumer Waste	
Materials and Resources	Landfill Images (graphs) https://www.epa.gov/sites/production/files/2018-07/image5.png Recycling Images (graphs) https://www.statista.com/chart/4470/the-countries-winning-the-recycling-race/ Sustainability Images (pictures and cartoons) https://docs.google.com/document/d/1G_Rsf05_pz_-AAkGiMdfxT3Nc3H25EYtwVMvXGGbcKQ/edit?usp=sharing Student observation grid https://docs.google.com/document/d/1m45uV06uCjCqL071mZNE1I55L_OcYoMX0SNu7vFT46w/edit Research questions and guidelines https://docs.google.com/document/d/10ttga94W5Yi3uBdKG4RN_DBiCGabppsDyP1PmnznxGk/edit?usp=sharing Variety of packaged products, scale, and Teacher/Student forms (below) and at https://docs.google.com/document/d/1m45uV06uCjCqL071mZNE1I55L_OcYoMX0SNu7vFT46w/edit Guest speaker Student class reflection journals		
INSTRUCTION	What will the teacher do?	What will the students do?	How much time for each activity?
Pre-assessment	Day 1- Teacher shows image of products in landfill: https://www.epa.gov/sites/production/files/2018-07/image5.png Write an observation and a question you have based on this image. Show image of countries recycling https://www.statista.com/chart/4470/the-countries-winning-the-recycling-race/ Which countries have proven the most successful in minimizing waste going to landfill through effective	Day 1- Students consider the images provided by the teacher. Students write observations and questions on post-it notes and hang them on a "parking lot" boards.	Day 1-40 minutes 15min

	recycling? Where does US stand? Teacher leads a discussion based on student responses to the images.	 Students read parking lot posts Students discuss the images and posts, in a teacher-led discussion	 5min 20min
Do-now/Hook	Day 2- Teacher prints two copies of pictures that show facets of sustainability: https://docs.google.com/document/d/1G_Rsf05_pz_-AAkGiMdfxT3Nc3H25EYtwVMvXGGbcKQ/edit?usp=sharing Teacher hands one to each student (so that two students have the same picture) Teacher facilitates the students' definition of sustainability with this prompt: "Let's start with a definition of sustain - To support; to supply; to maintain for a long period of time. Looking at this root word, thinking of our earth and how we live every day, what do you think sustainability means? Just 1-2 sentences in your own words. (At the conclusion of this project, you will journal what you have learned about Sustainability.)"	Day2- Students receive a picture showing an aspect of sustainability. Another person in the class will have the same picture and will these students will be thought partners later. Students write, then share, their definitions of sustainability	Day 2- 40 min 5min 10min
Procedure for Instruction/ Learning Activities	Day 2 (cont) and Day3- Teacher introduces the research questions the students will use as the frame for their work with the	Day 2 (cont) and Day3- Students will work separately, using the picture, to explore the concepts using the instruction: "What are your initial thoughts regarding this	Day 2 (cont) and Day3- 5min

	picture: "Choose to answer at least ONE of these questions using research: 1. What is the author's purpose in creating this picture? What is he/she trying to communicate? 2. Can you identify solutions to the problem that is shown in the picture? 3. How can you teach others about the solution to the problem? 4. What will the future of our planet be if the picture continues to be true? What will the picture look like in 50 years?" found at https://docs.google.com/document/d/10ttga94W5Yi3uBdKG4RN_DBiCGabppsDyP1PmnznxGk/edit?usp=sharing	picture? Just 1-2 sentences in your own words," found on: Students work separately, following these guidelines: "Your assignment: 1. Highlight the question(s) that you are answering (so I know). 2. Raise your hand and have a brief discussion with me about your topic. 3. RESEARCH and find new information about your topic and your question. Copy the links to your research here" found at https://docs.google.com/document/d/10ttga94W5Yi3uBdKG4RN_DBiCGabppsDyP1PmnznxGk/edit?usp=sharing	20min Day2 and 10 min Day3
	Teacher introduces the presentation guidelines for the student research: "Create two pages on the classroom Google slide presentation that shows your information. Page 1 - your name and information about the problem you are addressing Page 2 - your name and information about the solutions to the problem you are addressing NO pictures Only work on your own slide.	Students create two slides for the class slide show based on their picture and the answer(s) to the research question(s) they chose. Students follow the presentation guidelines shared by the teacher.	30min

	[Teacher creates a blank slide show and shares with class so that all students are working on their own 2 slides within the class slide show.]" Found at https://docs.google.com/document/d/10ttga94W5Yi3uBdKG4RN_DBiCGabppsDyP1PmnznxGk/edit?usp=sharing		
	Day 4- Teacher asks students to find the classmate who has the same picture. These students will work in pairs as thought partners.	Day 4- Students find their thought partners and sit together.	40min 5min
	Teacher introduces the guidelines for thought partners: "1. Share your slide with the partner that shares your topic (see Mrs. Paley). Revise your slide based on the response from your partner.	Thought partners share their work and revise their slides following the teacher's guidelines.	25min
	2. After our discussion in class, fill out your definition of Sustainability in your journal" Found at https://docs.google.com/document/d/10ttga94W5Yi3uBdKG4RN_DBiCGabppsDyP1PmnznxGk/edit?usp=sharing	Students pairs draft their definitions of sustainability and record it in their class reflection journals.	10min
	Day 5- Teacher shows group slide show and leads a discussion of the ideas presented by each set of thought partners.	Day 5- Students view the group slide show and participate in a class discussion focused on the ideas presented by each set of thought partners.	Day 5- 40min 20min

	Teacher and students come to consensus on a class definition of sustainability, and students record this definition in their class reflection journals. Day 6 and 7- Teacher collects various examples of packaging and sets up 6 stations (see "Teacher Worksheet" below). Teacher creates a form for students to record their observations, questions, and conclusions (see "Student Worksheet" below). Found at https://docs.google.com/document/d/1m45uV06uCjCqL071mZNE1I55L_OcYoMX0SNu7vFT46w/edit Note: The teacher will need to alter the worksheets based on the samples teacher has gathered. Teacher groups students to rotate through the stations and facilitates student completion of the response form. Day 7 (cont)- Teacher introduces the idea that a community guest speaker, with expertise in sustainability concepts (such as someone from a local waste management company), will visit the class tomorrow. Teacher guides student groups to develop questions for the guest speaker based on their station work.	Class comes to consensus on a definition of sustainability, and students record this definition in their class reflection journals. Day 6 and 7- Student groups rotate through the 6 sample stations and complete the response form. Day 7 (cont)- Student groups develop questions for the guest speaker based on their station work. Students record these questions in their class reflection journals	20min Day 6 and 7- Day 6 40 min and 20 min Day7 Day 7 (cont)- 20min

	Day 8- Teacher introduces the community guest speaker and facilitates the students' asking their questions Day 9 (closure)- Teacher leads students in developing: 1. a list of the " Topics to explore further" that students comprised as part of their summary 2. a list of classroom changes that could be made based on their learning 3. a personal goal regarding their habits that rely on packaging (such as snacking for example).	Day 8- Students attend to the community guest speaker and ask their questions. Students take notes in their class reflection journals. Day 9- Students develop: 1. a list of the " Topics to explore further" that students comprised as part of their summary 2. a list of classroom changes that could be made based on their learning 3. a personal goal to reduce waste, regarding a habit that relies on packaging (such as snacking for example).	Day 8- 40min Day 9- 40min
Differentiation	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. Reduce each station to 2-3 items; modify questions as needed. If a teacher aid is available, talk through the stations and use guiding questions to spark inquiry.		
Closure	Make a list of the " Topics to explore further" that students comprised as part of their summary. Make a list of classroom changes that could be made based on their learning. Students can create a personal goal regarding their habits that rely on packaging (snacking for example).		
ASSESSMENT			
College, Career, and Life Readiness Skills	See below Based on Middle-level Life/Career Rubrics available at https://nyctecenter.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 other's points of view and makes a definite effort to understand their ideas.	Sometimes listens to others, but often assumes ideas will not work. Tries to work well with the team.	Does not listen to group's opinions and ideas; wants things done own way.
Reads and Interprets	Reads, interprets, and applies	Reads, interprets, and	Reads but misinterprets and	Incorrectly reads, interprets, and

Workplace Documents	workplace documents correctly and with ease (e.g., instructional manuals, work orders, invoices, memorandums).	applies workplace documents (e.g., instructional manuals, work orders, invoices, memorandums).	misapplies workplace documents (e.g., instructional manuals, work orders, invoices, memorandums).	applies workplace documents (e.g., instructional manuals, work orders, invoices, memorandums).
Shares Responsibility	Motivates members to share contributions equally by valuing all members' ideas and contributions.	Participates in and contributes to group's work. Values all members' ideas and contributions.	Attempts to share responsibility of 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 other'sideas.
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.
Writes Clearly	Consistently writes clearly, uses correct grammar, and understands the intended audience of documents that are produced.	Writes clearly, generally using correct grammar, and understands the intended audience of the document produced.	Produces a document that is mostly well written but, sometimes uses incorrect grammar; shows general understanding of the intended audience.	Produces a document that is unclear, uses incorrect grammar, and shows a misunderstanding of the intended audience.
Contributes to Well-being of Community	Is a strong advocate for the community and always acts in a manner that benefits the community.	Understands responsibility of the individual to the community and acts in a manner that benefits the community.	Usually considers the well-being of the community even if occasionally acts in self-interest.	Favors self-interest over the well-being of the community.
Demonstrates Understanding of the System and Environment Influencing the Organization	Consistently acknowledges the economic, political, and social relationships that impact multiple levels of an organization and uses this knowledge in interactions within the group (e.g., local, national, international).	Acknowledges the economic, political, and social relationships that impact multiple levels of an organization (e.g., local, national, international).	Acknowledges some social relationships that impact multiple levels of an organization.	Does not acknowledge social relationships that impact multiple levels of an organization.
Sees Consequences of Actions	Consistently considers the implications and consequences of actions.	Considers the implications and consequences of actions.	Occasionally acts in ways that fail to anticipate consequences.	Acts impulsively and fails to consider consequences of actions.

Teacher Worksheet (for Days 6 and 7)

Station 1				
Description - station includes: paper bag with handle that says “Please recycle this bag”, Hefty printed bag that is reusable with a slide closure (no recycle logo); grocery store plastic bag, cloth bag				
Look at the bags.		What do you notice about the ability to reuse each?	What do you notice about the ability to recycle each?	What is the best choice and why? What is the least desirable and why?
Station 2				
Description - station includes various bottles of laundry detergent: 7th Generation made of cardboard, 4X concentrated, recycle logo, and info about the packaging; largest plastic bottle with spout, med size plastic bottle, small size plastic bottle. Need an ounce scale at station.				
Read the packages and the note the volume		Weigh the empty containers. Calculate the weight per container/amount of ounces. Record and compare. Answer: Is there less packing per container when purchasing the largest size?	Compare the amount of detergent that must be used per load. Calculate the amount of loads that each container can launder. With this comparison, how does “concentrated” effect the amount of packaging?	Read the labels about the content of the detergents. Which do you see is more environmentally safe for rivers and streams? Which is the least environmentally friendly?
Station 3				
Description - station includes plastic package of macaroni and cheese, paper box of macaroni and cheese (recycle logo on plastic, covered with foam sleeve of printing)				
Compare the packages for		Compare the packages.	What is the difference in the	What is your opinion about the “price that

macaroni and cheese		Which is more environmentally friendly and why?	purpose of these two packages?	you pay for convenience"? Do you think our earth should "pay this price"?
Station 4				
Description - station includes 5 packages - one is plastic with #5 recycle logo, one says "100% recycled cardboard", one says, "made from 100% recycled paperboard", one says,"please recycle packaging, one has recycle arrows with "paperbox".				
Read the information given to the consumer on each package.		Made a list: How would someone recycle each package? Compare the wording.	Research what is meant by "post consumer waste". Write your understanding.	Do you think any of these companies are giving the consumer enough information?
Look up the requirements of the recycling in your town.		Which of these items could you recycle in your waste pickup?	Which of these items would you need to trash (and put in landfill)?	What are your suggestions for any of these companies to change their packaging?
Station 5				
Description - station includes 5 packages of snack size items - one is yogurt with plastic cap that contains topping, one is smartfood popcorn,(lid and cup have different recycle numbers), one is plastic bag of minimuffins, one is plastic bag of apple wedges, one is cheese and cracker minibox (Other than the yogurt, there are no recycle logos on any of the packages.)				
Inspect all of the containers for information about the packaging.		Compare the packages. Can you recycle any of these?	How can you prevent all of these packages from going to landfill? Would you be willing to change how you buy your snacks? Can you eat the same items in a more	Look at the location of where each item was manufactured. Make a list and write down the miles traveled for that product to get to your town. How does distance

			environmentally way?	traveled effect our use of fossil fuels?
Station 6				
Description - station includes 3 packages of cellophane tape - one is a roll in a box that gets put on the tape holder on teacher's desk, one is tape in its own plastic dispenser (all disposable), one is a plastic pop-up tape dispenser on a cardboard backing with plastic cover.				
Compare the types of ways one can purchase tape	What do you notice in the packaging?	Does the tape perform the same function regardless of how it is packaged?	Which is the most environmentally friendly way to purchase tape?	What would the company do if everyone stopped buying one of these package types?
SUMMARIZE your learning	How does packaging effect landfills?	How can the consumer make a difference in his/her buying decisions?	How do you think companies would respond if consumers were more demanding in wanting to reduce landfill?	Name at least 3 further topics that can be explored to further understand the connection between packaging and the environment.

Student Worksheet (for Days 6 and 7)
Working with your group, carefully evaluate each package. Focus on the information on the packages and on the questions posed below for each station. Make connections between how we each choose what we buy and how we can be more thoughtful in making those choices.

Station 1				
Look at the bags.		What do you notice about the ability to reuse each?	What do you notice about the ability to recycle each?	What is the best choice and why? What is the least desirable and why?
Station 2				
Read the packages		Weigh the empty	Compare the amount	Read the labels about

and the note the volume		containers. Calculate the weight per container/amount of ounces. Record and compare. Answer: Is there less packing per container when purchasing the largest size?	of detergent that must be used per load. Calculate the amount of loads that each container can launder. With this comparison, how does "concentrated" effect the amount of packaging?	the content of the detergents. Which do you see is more environmentally safe for rivers and streams? Which is the least environmentally friendly?
Station 3				
Compare the packages for macaroni and cheese		Compare the packages. Which is more environmentally friendly and why?	What is the difference in the purpose of these two packages?	What is your opinion about the "price that you pay for convenience"? Do you think our earth should "pay this price"?
Station 4				
Read the information given to the consumer on each package.		Made a list: How would someone recycle each package? Compare the wording.	Research what is meant by "post consumer waste". Write your understanding.	Do you think any of these companies are giving the consumer enough information?
Look up the requirements of the recycling in your town.		Which of these items could you recycle in your waste pickup?	Which of these items would you need to trash (and put in landfill)?	What are your suggestions for any of these companies to change their packaging?
Station 5				
Inspect all of the		Compare the	How can you prevent	Look at the location

containers for information about the packaging.		packages. Can you recycle any of these?	all of these packages from going to landfill? Would you be willing to change how you buy your snacks? Can you eat the same items in a more environmentally way?	of where each item was manufactured. Make a list and write down the miles traveled for that product to get to your town. How does distance traveled effect our use of fossil fuels?
Station 6				
Compare the types of ways one can purchase tape	What do you notice in the packaging?	Does the tape perform the same function regardless of how it is packaged?	Which is the most environmentally friendly way to purchase tape?	What would the company do if everyone stopped buying one of these package types?
SUMMARIZE your learning	How does packaging effect landfills?	How can the consumer make a difference in his/her buying decisions?	How do you think companies would respond if consumers were more demanding in wanting to reduce landfill?	Name at least 3 further topics that can be explored to further understand the connection between packaging and the environment.