

CAREER CLUSTER: Transportation, Distribution & Logistics	DURATION: Approximately 20 sessions, but can be modified to fit classroom schedules. (Session = 45 to 50 Minutes)	TEACHER:	U.N. SUSTAINABLE DEVELOPMENT GOAL: #12 — Responsible Production and Consumption
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GLOBAL ISSUE OVERVIEW

The world’s population could hit 9.6 billion by 2050, putting more demands on the Earth’s limited natural resources. Unfortunately, our existing natural resources are too often squandered or damaged through current production and consumption patterns. For example, about one third of the food produced each year spoils or is lost in harvesting, transportation, retail, and/or storage. Fresh water is being polluted faster than nature can purify it. Household and commercial energy use, car ownership, and air travel — all significant contributors to carbon dioxide emissions — are on the rise.

Why should we care about inefficient production and consumption?

Not only will continuing these wasteful habits cause irreparable damage to the Earth, we would need three planets’ worth of natural resources to support this way of life as the population rises to 9.6 billion. Quite simply, our current practices are unsustainable.

What can we do about it?

The U.N. is dedicated to redesigning inefficient patterns of production and consumption in order to create a sustainable and dignified future for everyone on Earth. One of the U.N.’s specific targets for achieving this goal is encouraging companies to adopt sustainable practices. Experts in the transportation, distribution, and logistics sector can play an important role in helping companies make these crucial changes.

Global Competencies Addressed:

- *Investigate the World:* Initiate investigations of the world by framing questions, analyzing and synthesizing relevant evidence, and drawing reasonable conclusions about global issues.
- *Recognize Perspectives:* Recognize, articulate, and apply an understanding of different perspectives.
- *Communicate Ideas:* Select and apply appropriate tools and strategies to communicate and collaborate effectively — meeting the needs and expectations of diverse individuals and groups.
- *Take Action:* Translate ideas, concerns, and findings into appropriate and responsible individual or collaborative actions to improve conditions.

STANDARDS ADDRESSED

Career/Technical Knowledge and Skills	Academic Knowledge and Skills	21 st Century Skills
<p>Common Career Technical Core Career Ready Practices</p> <ol style="list-style-type: none"> 1. Act as a responsible and contributing citizen and employee. 4. Communicate clearly and effectively and with reason. 5. Consider the 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>Transportation, Distribution, and Logistics Career Cluster</p>	<p>Next Generation Science Standards</p> <p>Engineering Design:</p> <ul style="list-style-type: none"> • HS-ETS1-1. Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants. • HS-ETS1-2. Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering. • HS-ETS1-3. Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts. 	<p>21st Century Interdisciplinary Themes</p> <ul style="list-style-type: none"> • Global Awareness <p>Learning & Innovation Skills</p> <ul style="list-style-type: none"> • Creativity & Innovation • Critical Thinking & Problem Solving • Communication • Collaboration <p>Information, Media, & Technology Skills</p> <ul style="list-style-type: none"> • Information Literacy <p>Life & Career Skills</p> <ul style="list-style-type: none"> • Flexibility & Adaptability • Initiative & Self Direction • Productivity & Accountability • Leadership & Responsibility

- **TRC03.01.** Formulate ideas, proposals, and solutions to transportation, distribution and/or logistics related problems in order to ensure effective and efficient delivery of products or services to targeted consumers.
- **TRC03.02.** Analyze and evaluate ideas, proposals, and solutions to transportation, distribution and logistics related problems in order to select the best deliverable to meet business objectives.
- **TRC03.03.** Develop, implement, and evaluate solutions to transportation, distribution or logistics related performance problems using a structured problem-solving process in order to improve business functioning.

Common Core Academic Standards

ELA/Literacy:

- **CCRA.SL.1.** 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.
- **CCRA.SL.4.** 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.
- **CCRA.L.1.** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

Mathematics:

- **MP.1.** Make sense of problems and persevere in solving them.

PROJECT DEFINITION & GOALS/OBJECTIVES

This project stems from the United Nations Sustainable Development Goals (SDGs) initiative. The SDGs are a set of 17 goals that aim to end poverty, fight inequality, and stop climate change. Specifically, this project focuses on Global Goal #12: Responsible Consumption and Production, with an emphasis on encouraging companies to adopt sustainable practices. Students will engage in a design process to define the problem, brainstorm possible solutions, create and revise a solution, and present their solutions to community and/or global partners.

Goals:

- Students will gain an understanding of the United Nations Sustainable Development Goals initiative and develop an understanding of the importance of sustainable consumption and production patterns.
- Students will apply transportation, distribution, and logistics knowledge to a complex real-world problem.
- Students will use a design process to develop solutions to a complex real-world problem.

Objectives:

- Research the challenges and opportunities facing transportation, distribution, and logistics companies when it comes to adopting sustainable practices.
- Brainstorm and evaluate multiple possible sustainable practices a specific transportation, distribution, and/or logistics company could adopt.
- Design a sustainable solution for a specific transportation, distribution, and/or logistics company.
- Engage in a feedback and revision process to strengthen solutions.
- Explain and defend the potential impact of the proposed solution.

SCENARIO OR PROBLEM: What scenario or problem will you use to engage students in this project?

We know that current production and distribution patterns around the world are unsustainable. How can companies in the transportation, distribution, and logistics sector adopt better practices now in order to pave the way toward a safe and profitable future for all?

In small groups, you will compete against your classmates to design a useful, feasible, and sustainable practice that can be implemented in a real-life transportation, distribution, and/or logistics company (For instance, you could choose a company like J.B. Hunt, XPO Logistics, or UPS). You will present your solution to a panel of judges comprised of consumers and industry experts. Your presentation should include:

- A brief profile of your chosen company:
 - What are its various roles and major business functions?
 - How sustainable are its current practices? (You may choose practices related to transportation operations, logistics planning and management, warehouse and distribution center operations, facility and mobile equipment, and/or transportation systems/infrastructure, depending on the focus of your proposed solution.)
 - Is your company already working to implement more sustainable practices? If so, how?
- A detailed explanation of your recommended sustainable practice:
 - What should the company change or adopt in order to support U.N. SDG #12? (Your proposed practice could be related to routing, equipment, training, marketing, etc.)
- The challenges and benefits of your recommended sustainable practice:
 - When possible, propose realistic solutions to challenges.
 - Discuss benefits both to the company itself and to the wider community and world.

Your final presentation should equip the judges to make an informed decision about your recommended practice. You will be judged on the feasibility of the practice and the significance of the practice's impact.

Essential Questions	Grade Level Adaptations
<ul style="list-style-type: none"> • How does the transportation, distribution, and logistics sector impact global production and consumption trends? • What are the most significant obstacles companies face when it comes to adopting more sustainable practices? • How can companies in the transportation, distribution, and logistics sector adopt better practices now in order to pave the way toward a safe and profitable future for all? 	<ul style="list-style-type: none"> • Introductory classes might benefit from a list of preselected transportation, distribution, and logistics companies (such as UPS, XPO Logistics, and J.B. Hunt). • The project focus can be adapted according to course themes. For example, students could be required to design solutions related to a particular pathway within the transportation, distribution, and logistics career cluster.

ASSESSMENT: How will you determine what students have learned? (Check all that apply.)

FORMATIVE		SUMMATIVE	
Quizzes/Tests		Multiple Choice/Short Answer Test	
Notes/Graphic Representations		Essay Test	
Rough Draft		Written Product with Rubric	
Practice Presentation	X	Oral Presentation with Rubric	X
Preliminary Plans/Goals/Checklists of Progress	X	Other Product or Performance with Rubric	
Journal/Learning Log	X	Self-evaluation or Reflection	X
Other:		Evaluation by Authentic Audience	X
		Other:	

MATERIALS, RESOURCES, or CONSTRAINTS: What materials and resources will be needed? Are there any perceived challenges?

Materials:

- Computers with internet access
- Posters and markers for group brainstorming
- Final presentation rubric
- Commonplace book rubric (see Student Reflection section below for more information)

Resources:

- Library access for three days (access to journals, magazines, newspapers, and/or books)
- Local transportation, distribution, and logistics industry expert(s)
- [U.N. Sustainable Development Goals](#)
 - [Goal #12: Responsible Consumption and Production](#)
- [Sustainability efforts at UPS](#)
- [Sustainability efforts at XPO Logistics](#)
- [Sustainability efforts at J.B. Hunt](#)
- Video resources:
 - United Nations Foundation’s video, “[A Look at the Sustainable Development Goals](#)” (1:00). An introduction to the 17 Sustainable Development Goals from the United Nations Foundation.

Possible Constraints & Solutions:

- A local expert from the transportation, distribution, and logistics industry could enrich students’ research and ultimate understanding of the issue, but such an expert may not be available to be interviewed by every group. The schedule can be modified so the expert gives a brief presentation to the whole class instead perhaps via Skype, Zoom, or another video conferencing program.
- Similarly, the authenticity of final presentations and judging could be limited due to availability of volunteer industry representatives and/or community members. If possible, consider showcasing the final presentations via Skype, Zoom, or another video conferencing program.

SUPPORT, MODIFICATIONS, AND EXTENSIONS: What is needed to provide support for students who have difficulty learning the content, modify for students with special learning needs, or to provide enrichment for advanced students?

Support & Modifications:

- Provide assistance navigating library resources in week 2.
- Prepare a predetermined work plan for week 3 and check in at the end of each day to check students’ progress.

Extensions:

Advanced students may partner with local businesses or industry experts to implement their recommended solutions.

CALENDAR OF MAJOR LEARNING ACTIVITIES: What are the learning activities or tasks for each day? Are there any project milestones? When will formal assessment activities occur?

Week 1				
Monday	Tuesday	Wednesday	Thursday	Friday
<p>Initiating: Introduce SDG #12. Lesson should focus on answering the question, “Why is it important to adopt more sustainable patterns of production and consumption?”</p> <p>Introduce commonplace book (see “Student</p>	<p>Initiating: Expand on and deepen Monday’s conversation. Lesson should focus on answering the question, “What are the challenges of moving toward more sustainable patterns of production and consumption?”</p>	<p>Initiating: Discuss current sustainability trends and opportunities in the transportation, distribution, and logistics industry.</p>	<p>Initiating: Students generate questions related to three categories: current practices in the field of transportation, distribution, and logistics; obstacles to adopting more sustainable practices in the industry; and solutions or ways to</p>	<p>Initiating: Introduce project scenario and assign (or allow students to self-select) project groups.</p> <p>In their groups, students select the questions they’d like to pursue during the</p>

<p>Reflection Activity” below for details).</p>			<p>overcome those obstacles.</p> <p>Students could create mind maps (virtual or on paper) based on the three categories, then share them with three to five other students, adding to and expanding their own ideas in the process.</p> <p>Online mind mapping tools (optional):</p> <ul style="list-style-type: none"> • Mindmeister • Padlet 	<p>research process and divide those questions among group members. Tell students they will have the opportunity to interview a special guest from the industry next week as part of their research.</p> <p>At this phase of the project, students should stay focused on wondering and asking — not yet identifying a solution.</p> <p>At the end of the day, students reflect on the week:</p> <ul style="list-style-type: none"> • List three things you learned this week. • What’s one thing you would do differently if you could do the week over? • What’s one thing you want to learn more about?
Week 2				
<p>Planning: Students research production and consumption patterns based on the research questions</p>	<p>Planning: Students continue their research.</p>	<p>Planning: Introduce guest industry expert. Each group has ten</p>	<p>Planning: In their groups, students brainstorm sustainable practices (e.g., a new</p>	<p>Planning: Groups evaluate the pros and cons of each of their brainstormed</p>

<p>established last week. Encourage students to look for answers in a variety of sources: online or print journals, magazines, books, websites, or newspapers.</p>		<p>minutes to privately interview the expert.</p> <p>Before or after their interviews, groups may share and organize their research findings.</p>	<p>product, routing change, training system, marketing campaign, etc.) that could be adopted by a specific company. By the end of the day, students should have three to five ideas.</p>	<p>concepts. By the end of the day, students should agree on one idea.</p> <p>Students reflect on the week:</p> <ul style="list-style-type: none"> List three things you learned this week. What's one thing you would do differently if you could do the week over? What's one thing you want to learn more about?
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Week 3

<p>Planning: Teams make a work plan for next week by identifying tasks, setting goals for each day, and assigning tasks to team members. Work plans are approved by the teacher.</p> <p>Over the course of the week, students should profile their chosen company, create and/or detail their recommended solution, and prepare a persuasive presentation advocating for the solution.</p>	<p>Executing: Team work time according to student work plans.</p>	<p>Executing: Team work time according to student work plans.</p>	<p>Executing: Team work time according to student work plans.</p>	<p>Executing: Team work time according to student work plans.</p> <p>At the end of the day, students reflect individually on the week so far:</p> <ul style="list-style-type: none"> List three things you learned this week. What's one thing you would do differently if you could do the week over?
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				<ul style="list-style-type: none"> • What's one thing you want to learn more about?
Week 4				
<p>Executing: Each group gives a private practice presentation to the teacher. The teacher gives constructive feedback, and students work to apply this feedback.</p>	<p>Executing: Each group gives a private practice presentation to the teacher. The teacher gives constructive feedback, and students work to apply this feedback.</p>	<p>Executing: Each group gives a private practice presentation to the teacher. The teacher gives constructive feedback, and students work to apply this feedback.</p>	<p>Closing: Teams present their designs to the class and a panel of judges comprised of industry representatives and community members. Students will be judged on 1) the significance of the solution's impact and 2) the feasibility of the solution.</p>	<p>Closing: Teams present their designs to the class and a panel of judges comprised of industry representatives and community members. Students will be judged on 1) the significance of the solution's impact; and 2) the feasibility of the solution.</p> <p>Judges award the first through third place winners.</p> <p>At the end of the day, students reflect on their projects:</p> <ul style="list-style-type: none"> • What was it like to be judged on your solutions? • How much of an impact would your solution make in achieving SDG #12? • How feasible is your solution?

STUDENT REFLECTION ACTIVITY: How will students reflect on their work? Add reflection questions and/or activities here.

Commonplace book: Throughout the unit, students will compile all notes, questions, ah-ha moments, and reflections in a central location (such as a notebook, journal, or folder). This should include responses to the weekly reflection prompts, but also all materials and informal notes gathered throughout the unit. At the end of week four, students could create a collage or scrapbook from this material that showcases their learning.

Adapted from:

- “Sustainable Development Goals: Goal 12: Ensure Sustainable Consumption and Production Patterns,” 2018, New York: The United Nations. Retrieved from <https://sustainabledevelopment.un.org/sdg12>
- “Unit Planning Template” by the Southern Regional Education Board, n.d., Atlanta: Southern Regional Education Board.