

ACTIVITY 1: Design for Sustainable Packaging

Activity Objective: Take any current product and redesign its packaging to improve its environmental sustainability.

Definition: Design for sustainable or environmental packaging design is creating and using packaging that improves environmental sustainability. This process involves increased use of life cycle inventory (LCI) and life cycle assessment (LCA) to help guide the use of packaging which reduces the environmental impact and ecological footprint. The system takes a look at the whole supply chain: from basic function, to marketing, to LCA (life cycle assessment) and reuse. Additionally, an eco-cost to value ratio can be developed. The goals of sustainable packaging are to improve the long term viability and quality of life for humans and the longevity of natural ecosystems. Sustainable packaging must meet the functional and economic needs of the present without compromising the ability of future generations to meet their own needs.

Sustainable packaging needs more analysis and documentation to review design, materials, processing, and life-cycle. Companies implementing these actions are reducing their carbon footprint, using more recycled materials and reusing packaging. For example, the Agricultural Research Service is looking into using dairy-based films as an alternative to petroleum-based packaging. Instead of using synthetic polymers, these packages would be made of proteins such as casein and whey, which are found in milk and are biodegradable. More research is needed to improve the water barrier quality of the dairy-based packaging but advances in sustainable packaging are being followed. Companies have been reusing and recycling packaging when economically viable with minimal packaging as a common goal to reduce costs.

Sustainable packaging does not focus on just recycling. Packaging is frequently used as the measure of a company's overall sustainability, even though it may contribute only a small percentage to the total Eco Efficiency of a company as compared to transportation and water and energy use.

REVIEW VIDEOS:

LO: Product design for the environmental. Design for environmental health

<https://www.youtube.com/watch?v=QOTZVLQikDE>

Sustainable Packaging (Preview): <https://www.youtube.com/watch?v=B790vQEof0M>

How can we make packaging sustainable? https://www.youtube.com/watch?v=Iff7QO7F_p0

Materials: Chapter 12, paper, computer, printer. Internet Access, repackaging materials as needed.

Procedure:

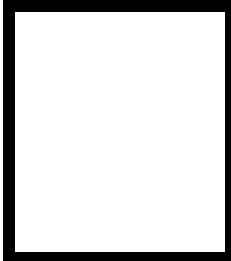
1. Work as partners or small teams.
2. Research the Internet for improved DFE packaging ideas for your suggested product packaging redesign.

3. Create packaging that conforms to the following goals of sustainable packaging and document what materials you used and why they improve sustainability. Specific factors for sustainable packaging may include the following:
 - a. Use of minimal materials: reduced packaging, layers of packaging, lower mass, and lower volume
 - b. Logistics efficiency from a complete life cycle
 - c. Energy efficiency, total energy content and usage, & use of renewable energy
 - d. Recycled Content: safety reflections for use of recycled plastics and paper with food products.
 - e. Recyclability – recovery value, use of materials which are frequently and easily recycled
 - f. Reusable Packaging: repeated reuse of package
 - g. Use of renewable resources
 - h. Use of biodegradable and compostable materials
 - i. Avoid use of materials toxic to humans or the environment
 - j. Effects on atmosphere/climate
 - k. Worker impact: occupational health, safety, clean technology
 - l. Made from materials healthy throughout the life cycle
 - m. Physically designed to optimize materials and energy
 - n. Use integral design to reduce the use of materials
4. Create the actual packaging or propose a design for that packaging. Extra credit for actually creating the packaging.



RUBRIC

4 World-Class Learner	3 Proficient Learner	2 Developing Learner	1 Emergent Learner
Learner at this level has gone beyond mastery of knowledge, skills, & attitudes described in project. World-class learner consistently exhibits high-quality performance.	Learner at this level has had opportunities to apply knowledge, skills, & attitudes of component of project. Proficient learner has mastered essential attributes, thus proving mastery.	Learner at this level has been exposed to & had opportunity to apply knowledge, skills, & attitudes of project. Developing learner may have only a few essential attributes to master before mastery.	Learner at this level may or may not have been exposed to knowledge, skills, & attitudes required by academic standards of the project.



- 1= Emergent Learner
- 2 = Developing Learner
- 3 = Proficient Learner
- 4 = World-Class Learner