

Make Mushroom Packaging to Explore Long-Term Ecological Impact

Name: _____

Date: _____

Student quiz — *Answer key*

Directions: Select the correct answer(s) for each question below.

1. Which of the following scenarios will influence the life cycle assessment of a plastic fruit container? (Select all that apply.)

- a. The company producing the containers switches from conventional to renewable electricity sources.
- b. The message “Please recycle this container” on the container leads to a decrease of 20% of containers ending up as solid waste, and an increase in recycled containers.
- c. The price of the containers is increased by 10%, leading to a 15% decrease in sales.
- d. There is a shortage in plastic beads, the raw material of the containers. As a result, the beads are no longer sourced locally. Instead, they are imported from overseas.

2. Which of the claims below are NOT true? (Select all that apply.)

- a. The issue of trash staying around for many years is hard to capture in a life cycle assessment.
- b. The management of solid trash is part of a life cycle assessment.
- c. Mycelium composite material looks promising because it is compostable, and thus reduces the trash problem.
- d. Growing mycelium composite packaging materials industrially will always be more eco-friendly compared to growing it at home.

Directions: Use the scenario below for question 3.

Scenario: You make birthday cards for your friends. You start by making paper from recycled packaging paper you have at home. You dry the paper in the sun, and dry wildflowers into the paper as decoration.

3. What factors make this homemade card likely to come out on top of a life cycle assessment compared to a similar store-bought card? (Select all that apply.)

- a. Per card made, less energy is used in recycling the paper at home compared to industrially.
- b. Per card made, more water is used in recycling the paper at home compared to industrially.
- c. You source the raw materials locally.
- d. Transportation of the final product has been cut out.

Directions: Use the scenario below for questions 4-5.

Scenario: You friend starts a cookie business and claims her cookies are eco-friendlier than store-bought organic mass-produced cookies. She uses only organic ingredients bought at a grocery store. The packaging of both types of cookies is similar.

4. Use the life cycle assessment tool to explain how your friend's cookies could be MORE ecofriendly compared to the store-bought cookies. Mention at least three stages of the life cycle of the cookies in your scenario.

Below is one example; students will have their own example. Ensure they cover at least three of the five stages of the life cycle of a product: raw materials, production, transportation, retail and use, end of life.

Example: Yes, the friend's cookies can be more eco-friendly than store-bought cookies. To reduce the impact of sourcing the raw ingredients, you could buy your ingredients at a local store that sources its products from local farms. During production, you could use renewable energy, and to reduce transportation, you could sell them locally at the farmers' market. In comparison, the company might import its grains and sugar from overseas, use conventional energy, and the cookies must be distributed to stores to sell them.

5. Use the life cycle assessment tool to explain how your friend's cookies could be **LESS** ecofriendly compared to the store-bought cookies. Mention at least three stages of the life cycle of the cookies in your scenario.

Below is one example; students will have their own example. Ensure they cover at least three of the five stages of the life cycle of a product: raw materials, production, transportation, retail and use, end of life.

Yes, it can. The company might be optimized to reduce their environmental impact and use only renewable energy (production stage). They might source their ingredients from organic local farms operating within a 20-mile radius of the factory (raw materials), and only sell the cookies at local farmers' markets (transportation). The factory could be optimized to have minimal waste.

Your friend, however, might use conventional energy to bake her cookies, buy her ingredients at a chain supermarket that imports goods from cheaper producers overseas, and her process might be less optimized. She occasionally has batches that are unsellable and go to waste. To sell her cookies, she might send them to friends who live farther away. The sum of these differences might make her cookies less eco-friendly.