

Product Design: Are Mushrooms the New Styrofoam? (Teacher Answer Key)

After watching the videos about Ecovative, imagine what a difference it would make if we could design more products using these closed-loop materials instead of polystyrene (the name of the plastic used to make Styrofoam).

Your task is to design, mold, and test an application for Ecovative material.

First, work in your group to brainstorm everything you can think of that incorporated polystyrene. Then, search online to see if you can identify even more uses.

Use the table below to record your findings. Students might need help to get started on this activity. Most will be able to think of the types of products mentioned in the videos: insulation, molding for package protection, etc. An online search will be able to help identify a larger variety of products. You might decide to have the class decide on one type of product that all groups will test, i.e. packing insulation, cell phone cover, etc., or you might allow each group to pick something different. A few examples are suggested below.

Use	How does it work?	How do you know if it is effective?
Coffee cup (thermal insulation)	Retains heat by surrounding the container and absorbing heat loss	Develop a coffee cup calorimetry experiment
Surfboard interior or Life-Saving ring (buoyancy)	Floats because it is less dense than water	Float a sheet and see how much weight it holds before sinking
Packing insulation	Protects items in shipment by surrounding them and absorbing impact	Do an egg-drop test
Water resistance	Provides a hydrophobic surface	Soak in water and mass it before and after to see if the mass increases

Now that you have an extensive list of uses, decide as a group which one you would like to test.

You will need to figure how:

- **What property you will test**
- **How you will make your mold for your Ecovative product**
- **How you will obtain a similar product made of polystyrene for comparison**

You will use the Experimental Design worksheet to create a test to use once your mushroom materials have been molded, grown, and dried.