



Keep It Fresh

CROSS-SITE DESIGN CHALLENGE VOLUNTEER GUIDE

Total Time: 3 hours

Overview

Academy participants from different cities will work collaboratively in teams of 3 - 4 as packaging engineers contracted by the management of Foodies, a national food and beverages manufacturer, to design a next-generation zero-waste sandwich packaging that will keep their sandwiches fresh and tasty.

Objectives

Participants will:

- Engage in a hands-on engineering design challenge.
- Develop social and emotional skills, particularly reflection, assertiveness, and active engagement.
- Demonstrate greater engineering awareness particularly related to the work of packaging engineers.
- Demonstrate employability skills, particularly people skills, communication skills, self-management skills, and thinking skills.
- Demonstrate the engineering habits of mind, particularly, systems thinking, problem-finding, and optimizing.

Challenge details

- This challenge is open to all current and past Next Engineers Academy participants.
- The challenge will be offered on the 11th April 2026 (subject to sufficient registration) starting at 9am EST | 2pm BST | 3pm CEST | 3pm SAST.
- Teams will collaborate via **Zoom**.
- During the final 20 - 30 minutes, teams will present their design proposals to you, the CEO of Foodies.

Design brief

Teams will respond to the following brief in the form of a **5 – 10 minute virtual presentation** to you, the CEO of Foodies.

Your team of packaging engineers has been asked by Foodies, a national food and beverages manufacturer, to design a zero-waste packaging solution for a new line of fresh deli sandwiches distributed and stored under refrigerated conditions.

The specific requirements are that your design must:

- *Maintain food safety and quality for 3–5 days under refrigeration (≤ 4 °C)*
- *Be easy to transport, pack, display, and open*
- *Be fully recyclable, compostable, reusable, or a justified combination*
- *Be cost-effective for large-scale production (ideally no more than US\$ 0.3 per unit)*
- *Be appealing to customers*



Specific constraints are that:

- *No preservatives may be added to the food*
- *At no point may the food be frozen*

Your design proposal must:

- *Describe your proposed packaging (including design sketches is a good idea).*
- *Explain how your design will ensure food safety and a production to consumption life of 3 – 5 days.*
- *Identify and justify all the materials used and state whether each is recyclable, compostable and/or reusable to minimize waste.*
- *Explain how it will protect the sandwich from crushing or leaking.*
- *Describe how it will allow for easy transport and display fridge stacking.*
- *Describe how it will allow customers to see and understand the product.*
- *Describe how it is easy to open without any tools.*
- *Estimate the cost per packaging unit.*
- *Note any trade-offs and limitations of your design.*

At the end of the time, you will present your proposal to the Foodies CEO. You may present your thinking in whatever form you choose (e.g., a slide deck, a document, an info-graphic) but your presentation should include annotated sketches, justifications for key decisions, and acknowledgement of any trade-offs or limitations inherent in your design. You will have 5 – 10 minutes for this presentation.

Open the full [Student Guide](#) to see the suggested process teams follow to complete this challenge.

Volunteer roles

- As a GE volunteer, you can support and add enormous value to this challenge in either of the following ways:
- Participate in the full session and move virtually between teams to offer guidance, support, insight, and assistance as required (2.5 - 3 hour virtual commitment).
- Play the role of the Foodies CEO to whom teams will present their design proposal, asking questions, interrogating their thinking, and providing feedback. See the evaluation guide below to assist you in rating each presentation on a set of criteria (30 minute virtual commitment).

Evaluation guide

Here are some of the things you should look out for in team presentations. High-quality proposals will:

- Demonstrate an understanding of the problem to be address and the fact that it requires trade-offs to be made
- Explicitly describe any assumptions that have been made with reasoned justification
- Explicitly name any trade-offs made and be able to explain why it was made
- Communicate clearly with annotated diagrams of their designs
- Use scientific reasoning to justify design choices, for example by specifically mentioning the impact of oxygen, moisture, and microbial growth of food items
- Provide a cost estimate as well as some justification

Lower-quality work tends to rely on unsupported claims or ignore constraints.

Suggested CEO review questions

Here are some questions you can ask to help you probe and evaluate student presentations.

- You claim a certain shelf life. What mechanism makes that true? Would you personally eat this sandwich on day x?
- What is the biggest food safety risk in your design?
- What happens if a fridge fails for 4 – 6 hours?



- How does your packaging improve on what is currently used? Is this truly sustainable?
- What assumptions are you making about manufacturing?
- Would our suppliers need new machinery?
- What happens to your design if I demand a 20% cost reduction?
- Will this packaging feel premium or cheap?
- How will customers understand how to dispose of it?
- Could this design adapt to different sandwich types or even different types of food?
- Could it scale internationally?
- Could competitors easily copy this?
- What competitive advantage does this give Foodies?
- Does this reduce food waste, packaging waste, or both? How did you come to decide on this balance?
- How would this strengthen our brand?
- What headline could we honestly put on the box?

