

**CLASSROOM ACTIVITY**

# Product Health

## OBJECTIVES

Students will:

- **Analyze** current needs in the consumer goods healthcare marketplace.
- **Develop** a solution to meet one of these needs.
- **Create** a prototype that demonstrates clearly how it seeks to solve this problem.
- **Perform** a SWOT analysis on their product to identify areas for improvement.

## OVERARCHING QUESTION

How can we develop new consumer goods to meet today's health needs?

## ACTIVITY SUMMARY

Students will explore the current health landscape of consumer packaged goods through the eyes of a product design engineer. They will collaborate to meet a need in the marketplace as they use the design thinking process to empathize; define the problem; ideate; and, prototype. They will conclude by completing a SWOT analysis on their product idea as they seek to identify areas for improvement.

## MATERIALS

- A device with the ability to project: one for the instructor
- Sticky notes: three per student
- Devices with internet access, at least enough for half the class
- *Designing Solutions Handout*, one per student

## CHALLENGE

1. Make a large triple Venn Diagram on the board labeled "Physical Health," "Social Health," and "Mental Health." Explain that physical health refers to our body's condition; social health refers to our ability to have relationships with other people; and, our mental health refers to our emotional and psychological wellbeing.

Distribute three sticky notes to each student and ask them to record at least one product or type of technology that they have used that connects to each category.

Then, invite them to place their sticky notes in the appropriate Venn Diagram categories on the board, and encourage them to consider if any of their ideas could be placed in the overlapping sections.

2. Once all products have been placed on the board, challenge the class to determine which ones could be considered consumer packaged goods (or CPGs).

Explain that CPGs are defined as products that customers use almost daily and restock frequently—such as food, beverage, makeup, cleaning products, clothing, and other household products. Their packaging is usually easily recognizable, and they are cheaper and replaced more frequently than durable goods, like cars. Proctor & Gamble (P&G) is the world's largest consumer packaged goods company.

Work together to identify any sticky notes that do not fall into this category and set them aside.

3. Explain that students are about to work in teams of three or four as they take on the role of product design engineers. Product design engineers research, develop, and improve products—including their production and packaging—that we use in our everyday lives. Teams of product design engineers will work together to identify a health need and create a prototype for a consumer packaged good that meets this need.
4. Distribute one Designing Solutions Handout to each student, and elaborate on the challenge by reading aloud the bullets listed under *Step 1: Define the Challenge*.
5. Explain that students will have about 15 minutes to work together and complete this step. Before they begin, bring students' attention to the Venn Diagram on the board and explain that empty spaces in the Venn Diagram could be a good indicator of where needs exist. Then, answer any questions students may have before you encourage them to get started.

## DESIGN

1. Bring the class back together and explain that it's time to develop a solution to the challenge. Call on a student to read the handout's *Step 2: Create a Design* section aloud.
2. Explain that another key part of the design process is prototype development. A prototype is a mock-up, sketch, or model of the product that you plan to create. A prototype gives you a better understanding of your product's design constraints and changes that may be needed to make the design functional. By collecting feedback and making changes early on, you save on production time and cost in the long run!
3. Tell the class that they will have about 15 minutes to complete the *Design* portion of their handout. Remind students to use a separate piece of paper to sketch and label a prototype that explains each of the requirements listed on this portion of the handout.

## SOLVE

1. Explain that groups will now collaborate to complete a SWOT analysis. Tell the class that SWOT is an acronym for strengths, weaknesses, opportunities, and threats. It is an analysis that can be performed on a specific product *or* an overall business. It is helpful through all stages of product development because it provides an opportunity to analyze progress and identify areas for improvement. Today, students will perform a SWOT analysis to analyze the potential of their product idea *and* assess current competitors.
2. Before they begin, students will be invited to take on new roles! Explain:
  - One group member will take on the role of a scientific communications manager, who oversees the development of a variety of scientific documents and presentations for companies that produce STEM products. Play the Scientific Communications Manager Career Profile video available at

<https://stemcareerscoalition.org/careers-portal> to help students gain a better understanding of this career. Discuss the responsibilities associated with this career and then have groups select at least one student to take on this role.

- Another group member will take on the role of a reliability engineer, who ensures that the products being manufactured meet the needs of the customer. Also play the Reliability Engineer Career Profile video available at <https://stemcareerscoalition.org/careers-portal> to help students gain a better understanding of this career. Again discuss the responsibilities associated with this career and then have groups select at least one other student to take on this role.

Any remaining student(s) can continue on as a product design engineer.

3. Write the following websites on the board:

- [us.pg.com/brands](https://us.pg.com/brands)
- [selectusa.gov/consumer-goods-industry-united-states](https://selectusa.gov/consumer-goods-industry-united-states)

Then, read the handout's *Step 3: Analyze Solutions* aloud. Explain that groups can use these websites to gain a better understanding of already-available consumer packaged goods as they complete their SWOT analysis.

4. Encourage groups to divide the workload and have each group member focus on one SWOT section. Then answer student questions, and give groups about 20 minutes to complete their research and share what they have learned with their group members.
5. As the class wraps up, ask each group to share a change they would make to their prototype based on the results of their SWOT analysis. If time permits, they may edit their prototype to include this change.
6. For further exploration at home or during a proceeding class period, invite students to watch the Design Engineer Career Profile Video available at <https://stemcareerscoalition.org/careers-portal>. Explain that mechanical design engineers are different from product design engineers. Challenge students to listen for their similarities and differences, and consider which one best aligns with their own interests and skillsets.

## STANDARDS

### Next Generation Science Standards

- Engineering Design:
  - 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.
  - 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.

### Step 1: Define the CHALLENGE

Your group's challenge is to take on the role of product design engineers as you brainstorm ideas for a new health-related packaged consumer good in one of the following areas: Food, Beverage, Hygiene, or Household Products.

Once you have selected a health category, complete the following steps in the Design Thinking Process:

1. **Empathize:** Do your group members have any health needs in this category? What health needs may others have in this category?
2. **Define the Problem:** Focus on one need and create a problem statement that answers:
  - *Who* is experiencing this problem?
  - *What* is the problem?
  - *Where* does the problem occur?
  - *Why* does this problem matter?

*Sample Problem Statement for the Food Category:* High school students (*who*) don't have access to healthy snack products (*what*) when they are at school (*where*) so they eat too much junk food from the vending machines (*why this matters*).

3. **Ideate:** How could you solve your problem with a consumer packaged good? Brainstorm as many ideas as possible!

Jot all notes below.

### Step 2: Create a DESIGN

**Overview:** The next step in the Design Thinking Process is to create a prototype. Choose one solution from above that your group believes best solves the problem, and then review the prototype requirements below.

**Requirements:** Your prototype must include:

1. A sketch of your product's general design.
2. Labels or descriptions that explain what this product is and how it will work.
3. A sketch or description of how this product will be packaged and sold.

Complete your prototype on a separate piece of paper.

### Step 3: Analyze SOLUTIONS

From your career's perspective, use the websites provided as well as your background knowledge to answer the SWOT questions below:

**Strengths:** What gives our product a competitive advantage? What makes it unique? What does it have that other products don't have? How will it help consumers solve problems?

**Weaknesses:** What weaknesses may hold this product back from success? What does our product *not* do? Would this impact the reputation of our product?

**Opportunities:** Are there any current trends that we could take advantage of? Are there any companies with whom we could try to partner? Are there any unfulfilled consumer needs that we could try to meet?

**Threats:** Who are our biggest competitors? What are they doing that we are not doing? Is there anything else outside of our control that could impact the success of our product?