

Product Designer: Creating the Best Headphones



Adventure Description:

In this adventure, students will think like a product designer and design a functioning prototype of a new set of headphones that will be competitive in the global headphone market.

Activity

Teacher Note: Each student or group of students will need a piece of cardboard with 3 meters of copper wire wrapped around it. We suggest wrapping the wire around the cardboard pieces before students come to class.

Step One: Background Information on Product Designers and Creating Headphones (5-10 minutes)

- Explain to students that product designers are responsible for creating new products in the market. Product designers wear a lot of different hats; they must be experts on market trends to make sure that a product can be marketed and sell well, must have experience using different materials to build things to create prototypes, and, depending on the products they design, must have a background in science! For example, did you know that headphones use electrical impulses from devices to turn them into sound waves?
- Show [Handout: Phases of Product Design](#). Discuss the steps that product designers undergo to make sure that they are creating a product that can be marketed through advertising or other methods. Ask students to brainstorm different ways that they could perform market research to determine what kinds of products are already available on the market.

Step Two: Concept Generation (20+ minutes)

- Explain to students that they will imagine they are product designers who have been hired to design a new type of headphones. Before they create a new set of headphones, they need to select a company to work for and learn more about the headphone industry and how headphones work.
- Provide students with the following handouts:
 - [Handout: Choosing a Company](#)
 - [Handout: Market Report on Headphone Industry](#)
 - [Handout: Science Behind Headphones](#)
- Explain to students that they will work in pairs or small groups to come up with an idea for a new pair of headphones based on the company they chose and the information they learned about the headphone market and how headphones work. Then, they will brainstorm ideas and sketch what their headphones will look like on [Handout: Headphone Design](#).

Please contact Allison Bischoff, Director of Teacher Support, at allison@rozzylearningcompany.com or 314-272-2560 with questions.

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- As students are working, discuss the following:
 - Why did you choose to design for the company you did?
 - How will you make your new product fit into the existing product line?
 - Why will this new product interest the company's target customer market?
- If time permits, have students complete a SWOT analysis. Provide students with [Handout: Completing a SWOT Analysis](#).

Step Three: Building a Headphone Prototype (25+ minutes)

- Explain to students that they will now create a functional prototype of the headphones they designed.
- Provide students with [Handout: Steps to Create a Functional Prototype](#).
- Provide students with the following materials:
 - Assortment or art supplies and building materials
 - 3 meters of 30 gauge copper wire
 - Old D battery for wrapping wire around
 - Tape
 - 2 round ceramic magnets (optional - 2 round neodymium magnets)
 - Aux Audio cord
 - 1 red wire with an alligator clip on both ends
 - 1 black wire with an alligator clip on both ends
 - Several types of cups for testing such as; paper, styrofoam, glass, plastic, ceramic
 - Access to a device with an AUX port (headphone jack) that plays music
- While students are working, discuss the following:
 - What cup gives you the best sound quality?
 - Why do you think that is?
 - What other material could you use to transmit the sound for your headphones, other than cups?
- Extra Time? Have students test their headphones' sound quality. Provide students with [Handout: Steps to Test Sound Quality](#).
- When students are finished building their headphones, have a concluding discussion about what students would do to validate their product in the market.

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Materials List

Provided online:

- Handout: Phases of Product Design
- Handout: Choosing a Company
- Handout: Market Report on Headphone Industry
- Handout: Science Behind Headphones
- Handout: Headphone Design
- Handout: Completing a SWOT Analysis
- Handout: Steps to Create a Functional Prototype
- Handout: Steps to Test Sound Quality

Not provided (Each group needs):

- 3 meters of 30 gauge copper wire
- Old D battery for wrapping wire around
- Tape
- 2 round ceramic magnets (optional - 2 round neodymium magnets)
- Aux Audio cord
- 1 red wire with an alligator clip on both ends
- 1 black wire with an alligator clip on both ends
- Several types of cups for testing such as; paper, styrofoam, glass, plastic, ceramic
- Access to a device with an AUX port (headphone jack) that plays music

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