

Prototyping for J.K. Rowling

by Blythe Bulkin

Grade Level

3rd Grade

Lesson Overview

In this lesson, the students will use the empathy and needfinding skills from the previous lesson to brainstorm solutions, and build and test prototypes—completing a full cycle of the design thinking process. The students will use the short bio of JK Rowling and incorporate her needs into the design and construction of their prototypes.

Learning Objectives

Students will:

- Brainstorm solutions
- Build prototypes
- Test prototypes

Standards

CCSS.ELA-Literacy.RL.3.1: Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.

CCSS.ELA-Literacy.RL.3.2: Recount stories, including fables, folktales, and myths from diverse cultures; determine the central message, lesson, or moral and explain how it is conveyed through key details in the text.

CCSS.ELA-Literacy.RL.3.7: Explain how specific aspects of a text's illustrations contribute to what is conveyed by the words in a story (e.g., create mood, emphasize aspects of a character or setting)

CCSS.ELA-Literacy.RL.3.9: Compare and contrast the themes, settings, and plots of stories written by the same author about the same or similar characters (e.g., in books from a series)

NGSS MS-ETS1-1: Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

NGSS MS-ETS1-2: Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

Preparation

- Prep design stations with sticky notes for brainstorming solutions and materials for prototyping
- Set up slide 9, Rules for Brainstorming

Materials and Resources

- 15+ square feet of cardboard
- Scissors
- Duct tape
- Paper
- Pens
- Colored markers, pencils, or crayons
- String
- Twist ties
- Post-its
- Pipe cleaners

Activity 1: “Yes And” (10 minutes)

- Practice thinking big. Go over slide 9, the rules for brainstorming.
- Explain a “yes and” attitude. It is important to build off of others’ ideas, and when you say “no,” it shuts people down. Demonstrate with a fellow teacher the brainstorming process for an example problem: “Busy students need a way to identify lost jackets and clothes because the lost and found is getting out of control.”
 - Teacher 1: “What if we had a tag system?”
 - Teacher 2: “Yes, what if the tags on clothes had student numbers on them?”
 - Teacher 1: “Yes, and what if the numbers were electronic and when you scanned them you were able to see a picture of the student who owns the clothing?”

- Teacher 2: “Yes, and what if there was a robot that knew the classrooms of these students and it delivered the clothes to them?”
- Discuss what went well with “yes and” brainstorming.

Activity 2: Brainstorm Solutions (15 minutes)

- Have the students put their POV statements from the previous lesson on chart paper and have the groups spread out. Tell the students that you are going to set the timer, and tell them to “think big” and use a “yes and” attitude. Tell the students that you want to see 50 solutions!
- At the 10-minute mark, tell the students to choose one solution to design and prototype.

Activity 3: Prototyping (15 minutes)

- Tell the students that they now have 15 minutes to use materials to prototype their solution.

Activity 4: Closure (10 minutes)

- Tell the groups that they have 3 things that they need to share:
 - POV statement
 - Prototype
 - How their POV statement relates to their design
- Have each group share to the class.

Troubleshooting

Circulate during the brainstorming phase to give students potential constraints to aid their idea generation:

- “You have a billion dollars.”
- “You have to design a tool.”
- “You have to design a service.”
- “You need to use technology.”
- “You only have \$100.”

Assessment

Compare the groups’ POV statements to their prototype designs, and consider how the students’ were able to connect the two.