



MAKER ED

LEARNING IN THE MAKING: Shoe Design Challenge

INTRODUCTION

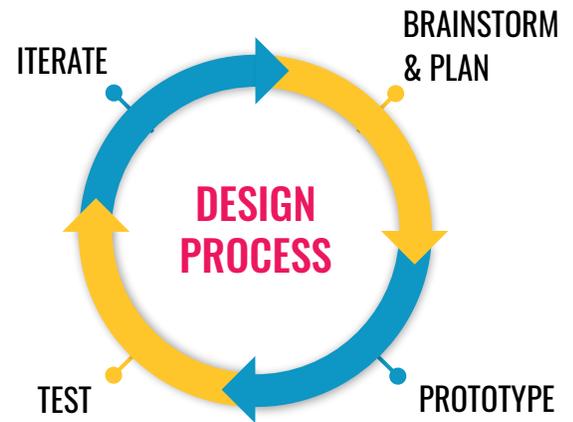
How do designers create new things? They follow a design process! First, they decide on specific design criteria, **brainstorm** their ideas, and sketch their **plans**. Next, they use a variety of available materials in order to build a **prototype** that meets their design criteria. After **testing** their prototype, they **iterate** on their design to make it better. Designers must be creative problem solvers!

Most of the things that make our lives enjoyable are products of designers. One example that we use everyday is shoes! Shoes require a lot of design work to make sure they are comfortable, stylish, protective, functional, and flexible. Designers must consider a variety of factors, such as who they are designing for, what materials are available, and how they fit, in order to design, test and improve prototypes of new shoes.

YOUR CHALLENGE

In this maker activity, your challenge is to use the design process to design a shoe that has the following criteria:

- Uses recyclable materials
- Stays on your foot on it's own
- Reflects your own personal style



Subject

Design



Standards

NGSS: 3-5-ETS1-1

Engineering Design. Define a simple design problem reflecting a need or a want that includes specified criteria for success.



Grades

3-5th
6-8th
9-12th



Key Terms

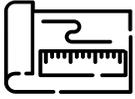
- Criteria
- Prototype
- Iterate



Tools & Materials of Making

This maker activity can be done with a wide variety of materials. Below are some suggestions to start with - be creative with whatever you have at home!

- **Planning supplies:** paper, pencil, markers, crayons
- **Base materials:** cardboard, construction paper, fabric, felt
- **Connecting materials:** tape, yarn, hot glue gun, glue sticks
- **Decorations:** pom poms, ribbon, yarn, markers, stickers
- **Structural support:** pipe cleaners, craft sticks, straws, twist ties, paper clips, sticks from outside

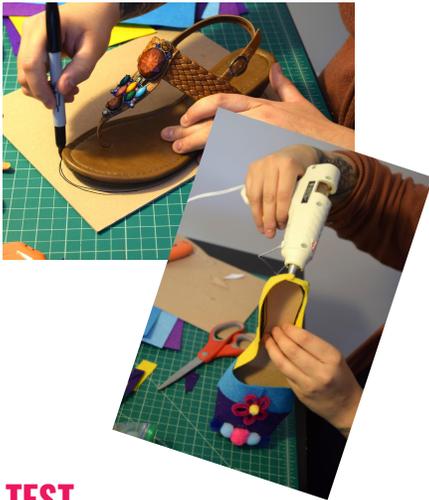


ACTIVITY INSTRUCTIONS

BRAINSTORM & PLAN

Come up with as many ideas as you can! Look over all the materials you have available and think about how you can use them in your design. Choose one idea that best fits the design **criteria**. Sketch your idea on a piece of paper and label the materials that you will use.

- What are your ideas for a shoe that has never been made before?



PROTOTYPE

Create a **prototype** of the shoe you designed! Start with a base by tracing your foot on a piece of cardboard or paper and cutting along the outline. Use a variety of materials to add to this base.

- What materials can you use to make sure the shoe stays attached to your foot?
- How can you make the shoe more durable?
- Can you add color or decorations to personalize your shoes?

TEST

Try on your prototype! Check your prototype for anything that might poke your foot. Walk, run, and jump around. Record your observations.

- What worked well in your design?
- What needs improvement?



ITERATE

Based on your observations, adjust your design to brainstorm, plan, build, and test a new prototype!

- What parts of your shoe can you improve and how?

Reflect After you complete the challenge, reflect on your experience:



- What problems did you have in your design and how did you use your creativity to solve them?
- What is something else around your house you could redesign?



Helpful Tip: There is no wrong way to do this activity! Designers are always trying new things. Don't be afraid to experiment with your design.



Criteria are things the design needs to do in order to be successful.



A **prototype** is a model that engineers use to test how a design works.



To **iterate** is to try something, adjust, and repeat to improve it.



Extra Credit! Write a slogan for your shoe or design a poster.



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#ShoeDesignChallenge



Watch this activity video here:
bit.ly/MakerEdShoeChallenge



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