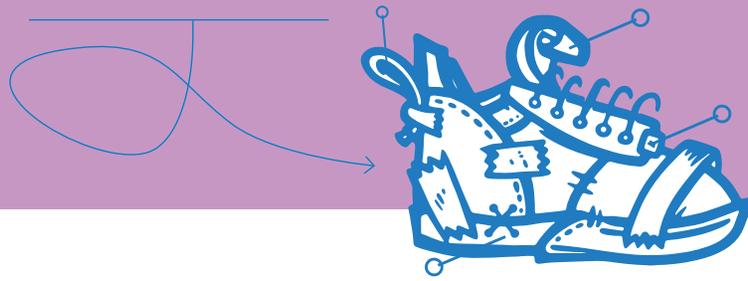


From the Sole Up Project Guide

PROJECT OVERVIEW:

Using the design thinking process, redesign an athlete's shoe from the sole up. The goal is to deliver the best possible shoe for their sport.



Project Intro Video:
From the Sole Up



Inspirational Video:
Futuristic Shoes



PROJECT CATEGORY:

Innovator

DIFFICULTY LEVEL:

Intermediate

TIME RANGE:

60 – 180 minutes

ESSENTIAL SKILLS/ MINDSETS THAT YOU MAY LEARN:

Design Thinking

Human-Centered
Design

Product Design

Iteration

Prototyping

Collaboration

Communication

TOOLS AND MATERIALS:

- 3-4 Sheets of Graph Paper
- Colored Pencils (variety of colors)
- Athletic Shoe Template (print on cardstock to save time)
- Cardstock Sheets (8.5 x 11)
- Scissors
- Stick Glue
- Cardboard
- Shoelaces

AT HOME SUBSTITUTIONS:

- Any crafty or recycled materials may be used in addition to (or instead of) the above materials to create your prototype. Though thicker paper is best for the top and sides of your shoe, you can also use regular typing paper in a pinch. (It'll just be a little floppier.)

MATERIAL PURCHASE LINK:

<http://tiny.cc/Intelbuylist>

Project Steps Dream It!

1

Watch the Intro and Inspire-To videos that describe innovative athletic shoes. [:15]

Note the ones you like. Describe what you liked about them: Color? Shape? Design? Functions? Form? Aesthetics?

Want more ideas? Watch this bonus Future Shoe video as well: youtu.be/xNUV7_7qbKQ

2

Review the article about the engineering that goes into athletic shoes. [:10]

illumin.usc.edu/the-engineering-behind-shoe-design

Think about the features and functions (Fig. 3 on the above website) that you want to include in your athletic shoe design.

Do an internet search for the materials used in athletic shoes. Jot down the materials you want to use in your athletic shoe design and prototype.

Draw It!

3 Using graph paper, sketch out several versions of athletic shoe designs based on your discoveries from the *Dream It* activities. [10]

4 Choose your favorite design, and make a larger drawing using colored pencils to label the characteristics. These can include special features, texture, and type of sole. [10]

Build It!

5 Build a 3D athletic shoe prototype out of cardstock. [30-50]

BUILD YOUR SHOE PROTOTYPE

- To begin, trace your foot onto the piece of cardboard and cut it out.
- Modify the cardstock template by visiting: <http://tiny.cc/protoshoetemplate>
- Be sure to include the same features as your design sketch. For example, you may have to modify the height of the ankle or the shape of the toe to accurately reflect your design.
- You may also want to decorate your shoe using colored pencils or markers before cutting it out. Remember to include your logo.
- Cut your template based on your modifications, and create a 3D cardstock version of your athletic shoe using the cardboard cutout of your foot as the sole. The paper shoe construction techniques in the following video can help: <youtu.be/lOoilpjhNXc>
- Add the shoelaces and any decorations to your paper model.

Share It!

6 Share your model with friends and family. Get feedback, kudos, and think about how you can make your shoe even better. [05]

Expand It!

Want to go deeper? Try these ideas to take your kicks to the next level!

- With parent or teacher permission, post a picture or short video of your athletic shoe prototype on Twitter, Snapchat, Instagram, or TikTok. Use the tag **#intelfutureskills**.
- Make a 3D Shoe in Tinkercad (tinkercad.com)—visit youtu.be/C9B_DbtHE5g for a short tutorial. Then, if you have access to a 3D printer, print out a small version of your design.
- Create a marketing campaign for your new athletic shoe. Your marketing plan can include commercials, jingles, videos, and social media campaigns.
- Want to try painting on leather shoes? Get some puffy paint or leather paint, and create one-of-a-kind custom footwear!

THINK ABOUT IT:

- Which sport are you designing your shoe for?
- What gender (if relevant)?
- How is your shoe unique? Is it different from other athletic shoes?
- What materials support the shoe's functions?
- Are there any special features at play?
- What do you think of the shoe's final appearance?
- Example Shoe Redesign Drawing: <http://tiny.cc/shoedrawing>

PRO TIPS:

The following can be helpful while you create your design and 3D paper prototype:

- Think about what makes a good shoe design—not just athletic shoes, but shoes in general.
- If you have an old athletic shoe lying around, cut it apart to see how it was made. (*Safety First:* Never cut toward yourself, and always move slowly and carefully when deconstructing a shoe).
- Try to design an athletic shoe that is truly new and different.

HELPFUL RESOURCES

- Learn how various companies design their shoes by watching Daily STEM's Shoe Design Playlist: tiny.cc/shoedesignvids
- Watch this great in-depth video on how sneakers are made: [youtube.com/watch?v=nS0t-H2kxmM](https://www.youtube.com/watch?v=nS0t-H2kxmM)

NEED MORE HELP AND INFORMATION?

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