

Helping Kids Learn – Post #12 4/29/20

STEAM: Architecture & Design

Sometimes people call the world we live in the “designed” world to distinguish it from the natural world. Everything beyond the natural world that we do or see or touch or hear has been *designed* by people. In this investigation we’ll look at some of the skills that make design fit into STEM to make STEAM. The investigation can be used by a wide range of learners. See [Lift the Level](#) below.

Be an Industrial Designer

Except for grass, trees, and other things in the natural world, all of the things you wear and use daily were thought of by a designer, even the way these investigation pages look. Make a list of the things you are wearing and seeing around you right now:

Industrial Designers create or improve products that are going to be manufactured (made in large amounts by machines). They need to understand both the function of a product – how it moves or fits or will be used, for example – and the form of the product – what materials will the product be made from, how do the materials behave (does the color run if it gets wet, for instance), and how the product looks, feels, smells, and, perhaps, sounds or tastes. They have to understand and use all of the STEAM fields: science, technology, engineering, art, and mathematics.

Typically, Industrial Designers come up with the idea, make a model (prototype) and refine it. Then they give everything to an Industrial Engineer who figures out how to use machines to manufacture it.

Investigation: Build a better sneaker. Use the Engineering Design Process from Post #6 as your guide. Yes, Industrial Designers use this method, too. You will need some paper, a pencil, paints or markers, and, maybe, tape or glue and scissors.

1. List all the things you *love* about your sneakers:
2. There’s usually something you would change to make them more comfortable, safer, or better for certain sports; make them out of better materials; make them useful for people with walking difficulties; or some way to improve the way they look. Write it in full sentences:



3. Make sketches of your new and improved sneaker from the top, side, and, if you're changing the inside or bottom, that view, too. Include the things you love, too.
4. Measure your own sneakers and include measurements in your design.
5. Next, make a model of the new sneaker using cheap paper: newspaper, magazine pages, etc. **Be careful with glue and scissors!** [Tip: you might mold the paper around your sneaker.]

New Sneaker Design

6. **Shark Tank your model:** Name your new sneaker. Show your model to someone and explain why it is better than the sneakers you have now. Make some notes to help you:

Sneaker Name: _____

What's so great about it?

Lift the Level You can make this lesson deeper and/or suitable for older students by any of the following:

1. Research sneaker construction. Make a sketch (you'll remember it better than copying and pasting!) of a cross section of the sneaker. (See [STEAM Online](#) below.)
2. There are many kinds of sneakers. Make a glossary or visual dictionary of all the kinds. Include in your research what differs in the different types. You may want to include why you prefer some.
3. Having a great idea is only the beginning. You must convince others to accept your idea. Look at your notes from the last part of the Investigation. Make a Marketing Plan to help you get your sneaker design produced.

STEAM Online

- See <https://www.youtube.com/watch?v=pmdQ9WCogEk> for a video on sneaker construction.

- There is an illustrated tutorial on shoe construction at <https://www.sneakerfactory.net/2015/12/shoe-construction/>. You do not need to buy the accompanying book.
- Nike has an article on how to become a designer for them: <https://careertrend.com/how-4966267-become-nike-shoe-designer.html>. We are not endorsing them or their products.
- There is a marketing plan template at <http://www.quickmba.com/marketing/plan/>. See <http://www.more-for-small-business.com/marketing-plan-outline.html> for a concise explanation of the main sections of a basic marketing plan.
- One source for more information about Industrial Designers is <https://design.njit.edu/bachelor-science-industrial-design>

NJ Student Learning Standards

Standard 9: 21st Century Life and Careers applies across grade levels. This investigation addresses:

- The 12 Career Ready Practices
- Standard 9.2 Career Awareness, Exploration, and Preparation
- Standard 9.3 Career and Technical Education (CTE)