

N Northeastern University Center for STEM Education

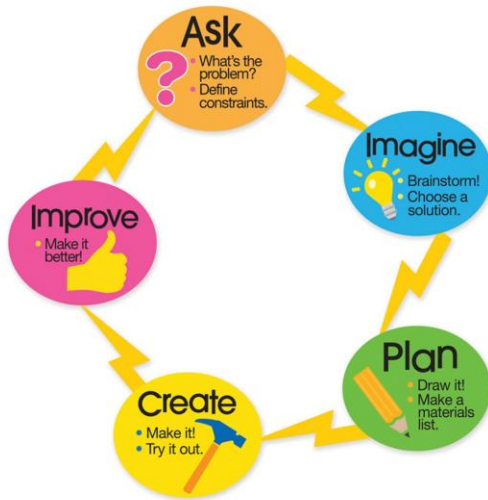
STEM Newsletter - Week 38 (February 20-26th, 2022)

National Engineers Week & Black History Month

Introduction

Welcome to the first newsletter of the year!

This week we'll be celebrating National Engineers Week, a week founded by the NSPE (National Society of Professional Engineers) in 1951 to commemorate the engineers of the future and showcase the importance of diversity, education, and understanding in this STEM career. National Engineers Week in 2022 begins on Sunday the 20th of February and ends on the 26th of February.



The importance of engineering has increased over the years as it is the backbone for many of the pivotal developments within the world of technology. Engineering operates the world around us from the production of cosmetics to jet engines and has been a key factor in the innovation and expansion of the healthcare and automotive industries. Engineers are problem solvers, innovators, and leaders. They use the Engineering Design Process (diagram on the left) to help create and design solutions to real-world problems. Engineering includes a broad range of careers that all have a focus on science and mathematics. Three well-known engineering fields are mechanical engineering, computer engineering, and electrical engineering.

Mechanical engineers focus on the development of mechanical products such as car engines. Computer engineers build the technology that powers computers like a workstation. Electrical engineers focus on the production of items with electrical components such as a roller coaster. Engineering is extremely important!

Do Now

[Why So Many CEOs Are Engineers](#)

Watch this video to see the intersection of engineering and business. Learn more about how engineering influences the big companies you know about! After watching the video, answer the following questions:

- **What do all these CEOs have in common?**
- **Why are they successful?**
- **Research two other present-day successful engineers that are making advances in STEM.**

Activity

I'm sure all of you have been told not to play with your food at some point. Well, forget that for a second! For this newsletter's activity, we'll be playing with our food for science, but fear not, none will be wasted!

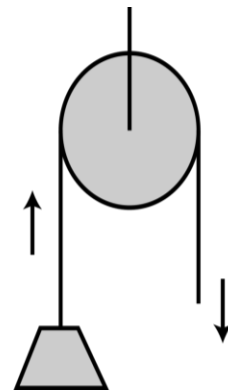
A pulley is a simple machine that is used to help carry things. It is a wheel on an axle (a rod) that has a rope wrapped around it. It is very helpful with moving objects, since it distributes the forces in a way that the person using a pulley can exert less effort. For this activity, we'll be making a snack pulley to transport our snacks, and also to learn more about engineering and the engineering design process!

Source: [Goldfish crackers STEAM Activity Snacks](#)

Materials Needed:

You can use any materials you want but here are some suggestions:

- Snack (goldfish crackers or similar)
- 3 straws
- twine
- 3 empty ribbon spools
- small plastic cup or container



- masking tape
- scissors
- pen or screwdriver to poke holes in cup

Steps:

- The first step for this activity is to create the pulley basket using your plastic cup/container. This will be where you place your snacks once complete. Poke two holes in the container, one on each side near the rim, leaving an equal distance between them. Create a small handle using the twine. Do this by looping it through the newly poked holes and then tie it.



- Cut the paper rolls to the length you desire, make sure they can all still stand straight

and that every pair has the same height.

- For each pole, poke a hole 1 inch away from the edge, and poke another hole directly across from it (also 1 inch away from the edge).
- For each pair of similar lengthed poles, put the ribbon spool in between the poles, and then connect the three objects using a straw (feed the straw through all the holes)
- Position your poles on the floor in your desired locations, and take them to the ground.



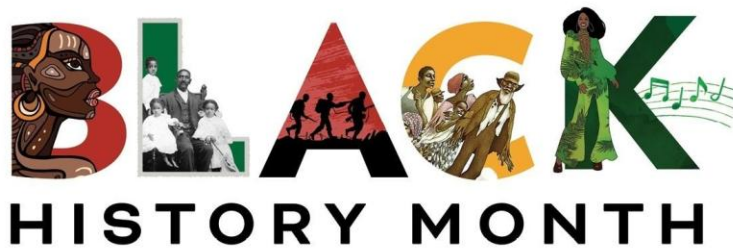
- Then, take your initial container with the twine and loop the twine through all the ribbon spools.
- And that's it! You can now play around with your pulley.

Discussion Questions:

- How does a pulley make transporting things easier?
- What happens when you place lighter or heavier objects into your pulley container? What do you notice?
- Where can you find pulleys in the real world?

Share Your Results

We'd love to know how the activity and/or the "do now" turned out! What worked and what didn't work? Please share with us something you learned and/or send us pictures! Email us at stem@northeastern.edu.



Northeastern Connections

In acknowledgment of Black History Month, Northeastern University is offering a [number of events](#). Black History Month was created to commemorate the contributions and accomplishments of the African American community. Join us in learning more about the Black Engineers at Northeastern and their amazing work!



Faculty Connection

Name: Richard Harris

Department: College of Engineering

Role: Associate Dean

Q1. Why did you decide to become an engineer?

I actually found an elementary school certificate that I filled out and signed which stated I was interested in Engineering. However, I really didn't know what it meant to become an engineer. I did later find in middle school/high school that being nurtured in math and science provided me with the option to pursue engineering.

Q2. What are the best parts of being an engineer?

The best part of being an engineer is the ability to impact society and the quality of life in so many different ways, depending on your engineering discipline.

Q3. What do you do as an engineer?

In fact, as an engineer, I contributed to saving the planet and preventing mutagenic defects of future generations as a result of helping to prevent the ongoing destruction of the Ozone Layer in the 1990s. This was part of the Montreal Protocol Treaty which included more than 180 nations globally.

Q4. What are the impacts of engineering in your field?

In my current role of engineering education, my impact is to help provide opportunities, pathways, and support to prospective students to understand the value proposition of engineering and how it can be a means to an end. For instance, you can attain an engineering degree and be very highly sought after in future areas if you are interested in going to medical school, law school, business school, etc. Engineering can be a means to an end.

Q5. Do you have any advice for students in middle school who are interested in engineering?

The advice I have is to explore and understand how much engineering impacts society across all aspects. Know that you don't need an Albert Einstein intellect. You just need to have a curiosity for how things impact our everyday lives and know that it is important to learn as best as possible in the study of sciences and mathematics. This includes but is not limited to: Gaming,

Cybersecurity, Pharmaceuticals, Materials, Sports equipment design, Artificial Intelligence, Machine Learning, Clothing, etc.



Student Connection

Name: Benoni Vainqueur

Major: Computer Engineering and Computer Science

Year: 3rd Year

Q1. Why did you decide to study engineering?

Engineering is the profession of solving problems from the inside out and learning on the way. Ever since I was a kid, I loved disassembling and figuring out how things around the house worked. I never formally decided that I wanted to pursue engineering before coming to college, but I realized that it aligned with my personality, and is where I find myself today!

Q2. What are the best parts of being an engineer?

Engineering is such a collaborative experience and no one knows all of the answers. It's amazing to work with and learn from other engineers. Additionally, the impact is one of the best parts of being an engineer. The decisions we make, and the work we do has an impact on many people, and you can see the fruition of your hard work.

Q3. What do you do as an engineer?

I am a Computer Engineering/Computer Science major. I mainly focus on robotics engineering, which is a mix of both. I have worked at Amazon Robotics as an automation engineer, and I will be working at Microsoft this summer as a programmer.

Q4. What are the impacts of engineering in your field?

Engineering is essential to the field of robotics. Robotics is a mix of various fields of engineering such as electrical, mechanical, computer, and sometimes even bioengineering. The advances that are made in the robotics field are sought out by engineers attempting to solve broad or very niche problems in their respective fields.

Q5. Do you have any advice for students in middle school who are interested in engineering?

You don't have to know everything right now! Don't be afraid to try something new, and don't be afraid to not like it. If you're willing to learn, you'll be sure to pick up something along the way.



Student Connection

Name: Zandria Hughes

Major: Industrial Engineering

Year: 4th Year

S-POWER Scholar

Q1. Why did you decide to study engineering?

I'm an Industrial Engineer here at Northeastern, but I initially started off as a Computer Science student in a completely different University. I was unsure if I liked Computer Science, but I decided to give it a try. After my first day of class, I realized it wasn't for me. I asked a bunch of different professors across different majors and loved the work the engineering professors did. I decided to switch majors and I've been loving Industrial Engineering ever since!

Q2. What are the best parts of being an engineer?

I love learning! I feel like I am constantly learning so much more about the world in all of my classes. I love learning about how things work and how to make them better. I think that I can really apply it to the "real world".

Q3. What do you do as an engineer?

I do a lot of hands-on work, but I also work and dabble in some software. My classes have been focusing on gathering data, simulating models, and a lot on finding efficient solutions to problems.

Q4. What are the impacts of engineering in your field?

Finance, healthcare, manufacturing, military services, home security, grocery stores and amusement parks, are just some of the areas that are greatly needed and impacted by industrial engineering! We help optimize processes and systems, so we help out everywhere!

Q5. Do you have any advice for students in middle school who are interested in engineering?

Do your best, and don't let someone tell you that you can't do it! Just try to improve and work on it and the results will follow.



Student Connection

Name: James Tukpah

Major: Electrical Engineering/ Mechanical Engineering/Robotics

Year: Masters Student

[S-POWER](#) Scholar

Q1. Why did you decide to study engineering?

I decided to be an engineer because at a young age my parents signed me up for a robotics class. It taught me a lot about what I could do and about how one person's ideas and perspectives can change the entire way other people view the world. That's what an engineer is to me. A person, whose thoughts and perspective help to change the world, and so I wanted to be that type of person.

Q2. What are the best parts of being an engineer?

The best part of engineering is how you can solve anything that you come across using it. The way you think about something and the approach you have to think about it can almost be used for any type of problem.

Q3. What do you do as an engineer?

I play with robots all day! But actually, I solve complex problems about the way that robots interact with the world and humans. Whether that is the way they perceive it, touch it, see it, or move through it.

Q4. What are the impacts of engineering in your field?

My field was created by engineering. Robotics would not be here without collaborative engineering. It takes many different fields to work. Advancements in computer engineering give us the technology and methods required to make a robot think. Advancements in electrical

engineering provide us with the technology and methods required to move and control the robot. Advancements in mechanical engineering give us the technology and methods required to model and analyze the robot.

Q5. Do you have any advice for students in middle school who are interested in engineering?

Never stop trying to solve things. And never be discouraged if you don't get it or if it's hard. Everyone starts at a point where nothing makes sense. I sure did, but the more and more you experience something the more you get to know about it, the better you get at it.

Related links/Extensions

- [Black History Month @ Northeastern](#)
- [Black History Month STEM Resources & Innovators to Know](#)
- [Engineers Week - DiscoverE](#)
- [ScienceMakers | The HistoryMakers](#)
- [National Society of Professional Engineers |](#)
- [Engineers Week | National Society of Professional Engineers](#)
- [Why Engineering is so Important to Society | GET](#)
- [Types of Engineering | NACME](#)
- [Black History Month](#)