SWEductional
ACTIVITY PACKET
INDUSTRIAL ENGINEERING EDITION

WHAT IS INDUSTRIAL ENGINEERING?

Industrial engineers design and create ways to improve processes, productivity, safety, and quality. They explore ways to eliminate wastefulness of material, money, time, and energy. This includes experimenting with designs and processes for areas such as manufacturing, health care, the environment, and utilities. Some examples of projects that an industrial engineer would work on are reducing the length of waiting lines at a specific location, altering a product to prevent any possible injuries, finding ways to increase customers, and so much more!

Do you like prizes? How about showing off your project work? Submit a photo of your **completed Industrial Engineering activity** through the link below! You'll see your project featured on the class page, and even be entered into a raffle for the chance to win a GIFT CARD!

PHOTO RAFFLE

Get your cameras ready and stay tuned... there will be a photo raffle in the next packet!

Gift Cards to...
- Starbucks
- Michael's
- In-and-Out
- Five Below
- More!

Submit Here! Or type the link below:

https://forms.gle/AcEXCZkePKxmqJCJA

IMPORTANT TERMS

Efficiency: maximizing productivity while minimizing waste

- You are working at great efficiency when you are building something and use the least amount of time and materials as possible to finish it.

- In this activity, you will explore your efficiency skills and try to find ways to make a sandwich in the shortest amount of time possible.

- What are some ways to increase efficiency?

Optimization: using resources in the most effective way

- If you are working in a group of four on a project and each of you is working on a different task instead of everyone working on the same, small part of the project, your group is optimizing the time you spend working.

- In this activity, you will optimize the process of making a sandwich.

- Why would engineers want to optimize processes?

Systems: parts of a whole that work together

- Your neighborhood roads, roads leading into cities, and highways all work together to form a road system that you can travel on.

- In this activity, you will explore the sandwich-making system and see how you can change steps in this system to make your sandwich more quickly.

- What are examples of some other systems? (Hint: one place to look for systems is in nature!)

ACTIVITY INSTRUCTIONS

Today, you'll be making a snack for you and your family!

Challenge yourself by finding different ways to prepare a sandwich as fast as you can! In this activity, you will explore how creating a plan or a system will help you do tasks as efficiently as possible, just like an industrial engineer!
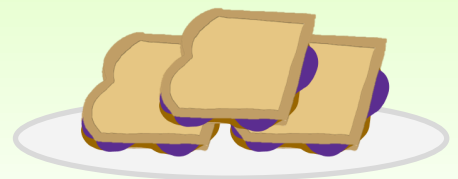
SUPPLIES

- A clock or a stopwatch

- Paper and pencil (to record time)

- At least 2 slices of bread

- Peanut butter and jelly **(or your choice of sandwich spreads!)**

- A spoon (for putting the spread on the bread)

- A plate (to put your sandwich on)

STEPS

1. Before starting this activity, be sure to wash your hands first!

2. Gather your ingredients and organize them on a table. Think about questions like:

    a. What arrangement do you need to prepare your sandwich in the fastest and easiest way?

    b. What type of spoon would be a more efficient tool? Which side would be easier?

    c. What can you do to minimize waste? (Example: Keep the spread closer to avoid dropping it on the way)

We're using peanut butter and jelly as an example,
but you can choose any sandwich spreads that you like!

3. Now, write down how long you think it will take you to finish making one sandwich.

4. Set up your stopwatch and start the timer when you begin making your sandwich. Stop it as soon as you finish making it. (Try your best to keep your table clean!)

5. Write down how long it took you to make the sandwich. Compare it with your guess:

   a. Did it take longer than you thought? Why do you think that happened?

This is an example activity table.

6. Repeat the activity as much as you'd like! Each time, think of a different way to make it:

   a. Should you rearrange your ingredients?

   b. Ask another person for help?

Remember: The goal is to complete your task as efficiently as you can!

You can do this same process with other activities like cleaning your room, doing your homework, and even with cleaning up your table right after this activity!

Anything you want to finish quickly!

RESOURCE LINKS / VIDEOS

- Biomedical & Industrial Engineering Crash Course - https://www.youtube.com/watch?v=O6lENrRANxY
- What is Industrial Engineering? - https://www.youtube.com/watch?v=5twpa1xmlJ0
- Disney Engineer: Industrial Engineering Role Spotlight - https://www.youtube.com/watch?v=YVWAo_MN_F8
- How They Make McDonald's Fries - https://www.youtube.com/watch?v=4WrqbDFGiuc

CAL POLY ENGINEER SPOTLIGHTS

My name is Evelyn Chavez and I am a 4th year Industrial Engineering major. I decided to go into industrial engineering because it is more people-oriented. I get to talk to my groups and learn about systems and what makes up an entire company. I've always been really impatient, so making things go faster is everything I do now. I also really love data and analyzing it. It's so interesting to see what you can get out of just some numbers on a paper. You can get information that can be really important to your client! Maybe your school's favorite dessert is ice cream, then if there's more ice cream parties, your school will be happier! It's all about knowing your audience and then working from that.

My name is Christina Adams and I am a 4th year Industrial Engineering student. I absolutely love industrial engineering: I love focusing on process improvement, project management and data analytics. I have enjoyed projects utilizing the advanced side of Excel to better understand large sets of data such as macros, index matching, and pivot tables. My classes at Cal Poly have prepared me for industry by exposing me to Excel, Solidworks, Microsoft Project, Python and many more softwares! This past summer I interned at Accenture as an analyst where I worked on a client team to restructure a Fortune 500 company utilizing a large data set. I enjoy cutting edge work in technology and look forward to being a Consulting Development Analyst at Accenture next fall!