How is COVID-19 Spread?

Scientists and doctors conducted research on how COVID-19 spreads.

Many of the rules that apply to other viruses also apply to COVID-19.

Here, we'll learn some basics about virus transmission so you can build on existing systems to keep your school safe!
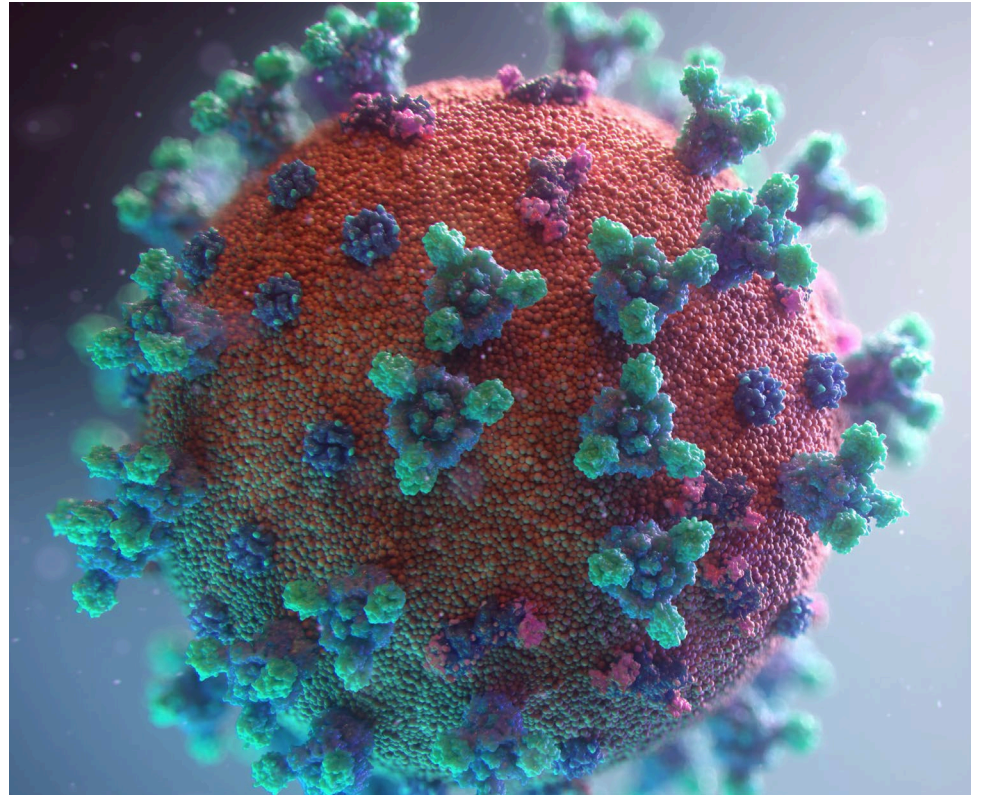
Photo by Fusion Medical Animation on Unsplash

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Through the Air

One of the main ways COVID-19 is transmitted is through the air, via respiratory droplets[1]. These droplets can be spread when individuals:
-Speak
-Sing
-Cough
-Sneeze
-Breathe

Droplets can stay in the air and spread well over six feet. Anyone who inhales these droplets is at risk for contracting the virus themselves.

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On Surfaces

When droplets in the air settle onto surfaces, those surfaces can also spread COVID-19.

People risk contamination when they touch these surfaces and then touch their eyes or face. High-touch surfaces could be exposed to the virus at higher rates. Examples of high-touch surfaces include:

-Computer keyboards
-Shared desktops
-Door handles
-Faucets

While it appears that surfaces aren't the main way people contract COVID-19, it's important to keep them clean and regularly sanitized.

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High-Risk Situations

Understanding that COVID-19 is largely spread through respiratory droplets in the air, a number of everyday school scenarios could actually be considered high-risk.

If many people are in close proximity, the danger of contracting COVID-19 is increased.

Examples of scenarios like this include:
-Riding the school bus
-Waiting in line in the cafeteria
-Sitting in crowded classrooms
-Attending sporting events

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The Most Effective Measures

The CDC[2] makes numerous recommendations to help slow the spread of COVID-19. A few of them include:

Wearing a mask whenever you're around people from outside of your household and can't stay at least six feet apart.

Social distancing by standing at least six feet apart from others when in public or around people from outside of your household.

Regularly cleaning and disinfecting to eliminate the virus from surfaces.

Handwashing to kill any viruses or bacteria.

How Can Industrial Engineers Help?

Industrial engineers improve systems (like schools) by focusing on three areas:

-Processes (what people need to do)

-People (how their actions factor into the solution)

-Technology (electronics, devices, or other items that are involved in the solution)

The Industrial Engineering Triad
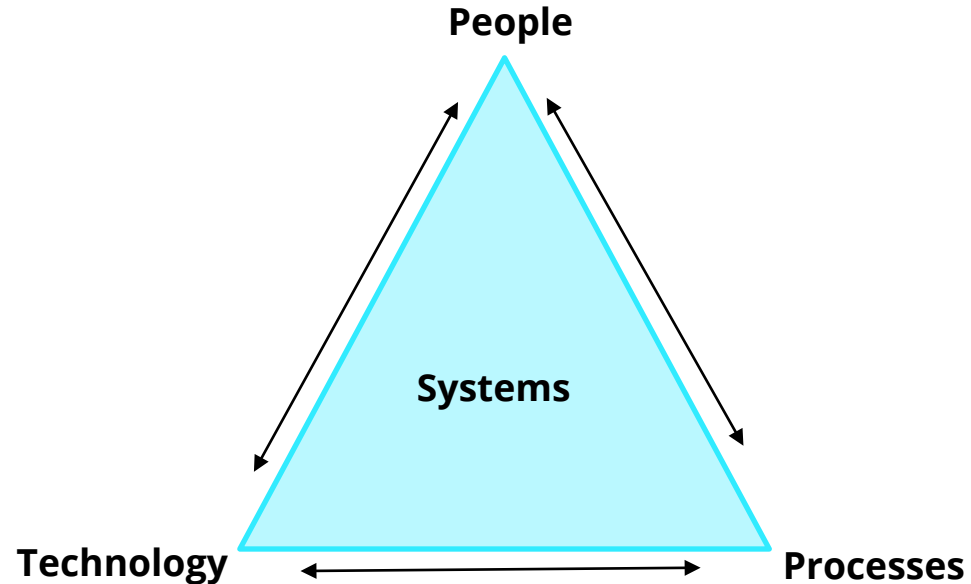
Industrial Engineers improve systems by working with people, technology, and processes.

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Examples of Industrial Engineers

Justin

Works in a cereal factory where he coordinates people, machines, and processes to keep things running smoothly.

Sally

Works in a laboratory where she collects data and observes processes to improve safety.
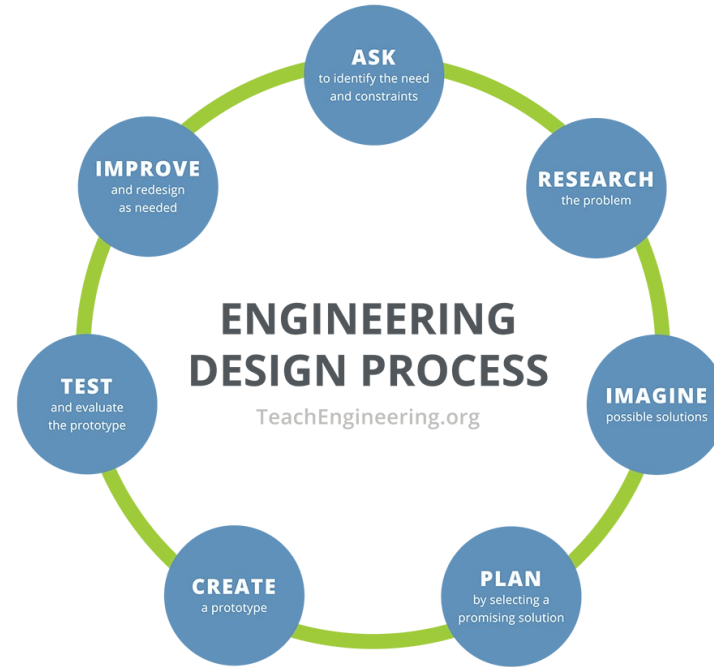
Li Wei

Works in a warehouse where she breaks down supply chains to move products from factories to customers, efficiently.

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Using the Engineering Design Process Like an Industrial Engineer to Help Your School

This is the engineering design process. Since your school already has its own COVID-19 procedures in place, we won't be working from scratch.

Your school has already gone through this cycle once. Your job is to start at Step 5 to improve the process!

ENGINEERING DESIGN PROCESS
TeachEngineering.org

ASK to identify the need and constraints

RESEARCH the problem

IMAGINE possible solutions

PLAN by selecting a promising solution

CREATE a prototype

TEST and evaluate the prototype

IMPROVE and redesign as needed

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Let's Get Started

Now that you know the basics of:

-How COVID-19 is transmitted

-The best ways to prevent the spread

-How industrial engineers can help

-The engineering design process

Let's take a look at how schools across the U.S. have handled the pandemic.

References

1. Coronavirus (COVID-19) frequently asked questions. (n.d.). Retrieved November 30, 2020, from https://www.cdc.gov/coronavirus/2019-ncov/faq.html

2. Coronavirus (COVID-19) frequently asked questions. (n.d.). Retrieved November 30, 2020, from **https://www.cdc.gov/coronavirus/2019-ncov/faq.html**

3. Tarte, J. (2015, October 10). The engineering design process. Retrieved December 07, 2020, from https://twitter.com/justintarte/status/652848647869087744