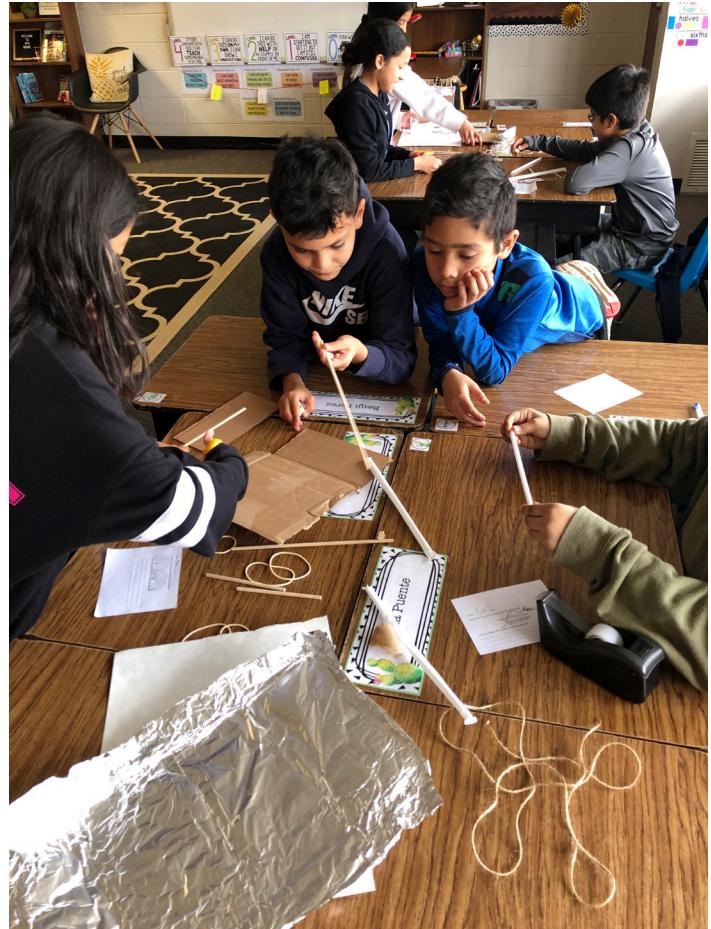


ITEEA's Elementary STEM Council's Third Annual Global Design Challenge for Elementary STEM Students

In 2008, the U.S. National Academy of Engineering (NAE) identified 14 Grand Challenges for Engineering in the 21st Century. The Grand Challenges were designed to cause students and educators to think about solutions to the big challenges affecting all of our lives. It's now time for elementary-aged students to get in on the action and show the world that they can solve big STEM design problems as well. ITEEAs Elementary STEM Council is sponsoring the 3rd Global Design Challenge for Elementary STEM (GDC) to provide students with a chance to solve a real problem, and show the world that everyone can help find solutions to these global challenges.

The Process

Elementary STEM students from around the world will work in small design teams to solve the GDC outlined below. As students attempt to solve the GDC, the elementary classroom teacher will document the process with a simple portfolio that describes the problem-solving process, the products developed, results of product testing, as well as the final product presentations. Photos and videos of proposed solutions will be posted on the Elementary STEM Council's Facebook® site. The design teams will be evaluated and the winning team will be invited to present their solution during the International Technology and Engineering Educators Association Annual Conference in Denver, Colorado on March 24-27, 2021. This team will also be featured in the March 2021 edition of *The Elementary STEM Journal*.



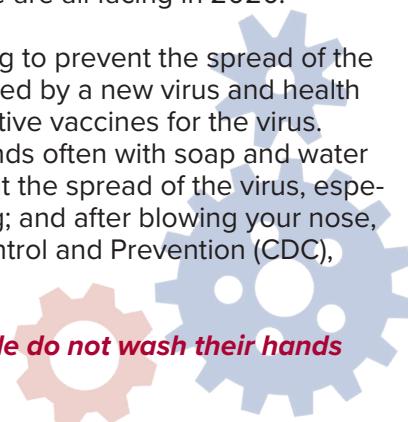
The Global Design Challenge

One of the original Grand Challenges (NAE, 2008), called for engineers to design systems that helped people live more healthy lives. You can search online using the phrase "grand challenges" to find more information. The 2020 Global Design Challenge calls on you and your team to develop a product that might help solve a world-wide dilemma that we are all facing in 2020.



In 2020, nations around the globe are struggling to prevent the spread of the Coronavirus 2019 (COVID-19). COVID-19 is caused by a new virus and health care officials do not yet have adequate or effective vaccines for the virus. However, the CDC does know that washing hands often with soap and water for at least 20 seconds is a great way to prevent the spread of the virus, especially after going to the bathroom; before eating; and after blowing your nose, coughing, or sneezing (Centers for Disease Control and Prevention (CDC), 2020).

The most common problem is that most people do not wash their hands often enough, nor long enough.



Challenge:

Can you work as a member of a small design team to develop or modify a product or device that will encourage people to properly wash their hands for at least 20 seconds?

Standards:

- **STEL #1C:** Recognize that creating can be done by anyone. Using technology and engineering tools and techniques, anyone can design or improve things to enhance their lives. Creation of new knowledge, approaches, and inventions can occur through either individual or collaborative efforts. Even young children can view themselves as creators.
- **NGSS 3-5-ETS1-1** Define a simple design problem reflecting a need or a want.

Big Ideas:

- Washing hands often can prevent the spread of viruses.
- Some products are designed to help people take care of themselves.
- Many special tools and devices are used to remind people of important things.

Limitations:

1. Develop a product, not a method—many methods are available on-line.
2. Use low-cost or free materials to develop your prototype that will remind people to wash their hands often and help them wash for at least 20 seconds.
3. Make sure that the product does not require a common language—could be used anywhere.
4. Test your product with classmates and document how well it works.

To the Teacher:

1. Encourage your students to use the engineering design loop and document this with a design journal or portfolio and a final product pitch.
2. Take lots of pictures throughout the design activity and a final video (3 minutes max.) where the teams present their findings and their product.
3. Require the students to present and defend their product in a formal product pitch—an authentic audience would be ideal
4. Submit the results to Virginia Jones at vjones@patrickhenry.edu or Thomas Roberts at otrober@bgsu.edu no later than December 15, 2020.

References

Centers for Disease Control and Prevention (CDC), 2020. www.cdc.gov/coronavirus/2019-ncov/community/get-your-household-ready-for-COVID-19.html. Downloaded on March 3, 2020.

U.S. National Academy of Engineering. Grand Challenges. www.engineeringchallenges.org/GrandChallengeScholarsProgram.aspx. Downloaded on March 14, 2016.

Questions?

Email Michael Daugherty at mkd03@uark.edu or Thomas Roberts at otrober@bgsu.edu.

All photos courtesy of Jones Elementary, Springdale, AR.

