

*Raven Hill Discovery Center, incorporated in 1991, is a 501(c)(3) tax-exempt organization.*

**Mission:** Raven Hill provides a place that enhances hands-on and lifelong learning for all ages by connecting science, history & the arts.

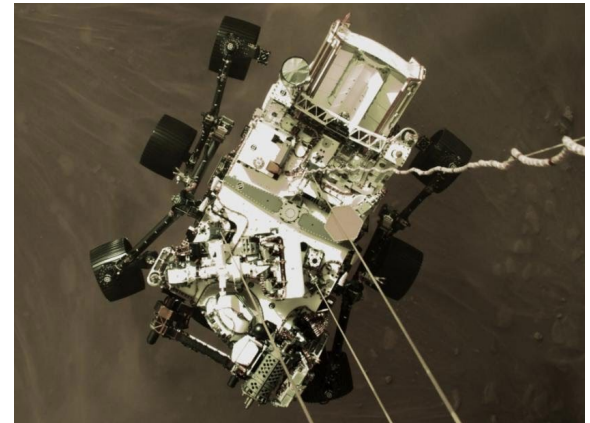
To: Friends and Family everywhere  
From: Cheri and Raven Hill  
Date: February 20, 2021  
Re: Weekly Update

Greetings, Everyone!

What an exciting week it has been. On Thursday afternoon, February 18, 2021, Raven Hill watched excitedly as NASA's Perseverance Mars Rover landed on the surface of "the red planet". The rover traveled almost 300 million miles, leaving Earth about 6 months ago. Perseverance prepared for its long journey during the current COVID-19 pandemic.

Acting NASA Administrator Steve Jurczyk said, "The Mars 2020 Perseverance mission embodies our nation's spirit of persevering, even in the most challenging of situations, inspiring and advancing science and exploration. The mission itself personifies the human ideal of persevering toward the future and will help us prepare for human exploration of the Red Planet in the 2030s."

Perseverance is the **first** mission to search for signs of ancient life on Mars. It carries Ingenuity, the **first** helicopter to fly on another planet. It is also making the **first** sound recordings of Mars. Plus, what a perfect name for a rover launched during this pandemic, when we have all been called on to persevere.



(Above) Perseverance, a car-size robotic explorer, gets ready to touch down on the surface of Mars. NASA/JPL

(Below) Raven Hill uses raw eggs to simulate a Mars landing in one of its popular STEM outreach programs into local classrooms.



NASA's Perseverance Mars Rover tweets, "Hello, world. My first look at my forever home." #CountdownToMars [pic.twitter.com/dkM9jE9I6X](https://pic.twitter.com/dkM9jE9I6X)

Mars will be visible next to the moon in the night sky this coming Thursday evening, February 25<sup>th</sup>. Be sure to look up and wave at our newest robotic explorer.



(Left) Ingenuity has not yet been deployed on Mars, so this photo is a simulation. On Twitter though, Ingenuity says, "I'm safe on Mars. Perseverance will get you anywhere." (@NASAPersevere)

Also, be sure to give a “shout out” to your favorite local engineers. Next week, February 21-27, is **National Engineers Week**. Engineers Week, or **E-week** for short, is a time to celebrate how engineers (and all scientists) make a difference in our world.

**STEM (Science, Technology, Engineering, Mathematics)** activities have been a large part of Raven Hill on-campus and outreach programs from the very beginning. Since 1993, the Center has collaborated with Charlevoix-Emmet Intermediate School District to offer **Science/Math Career Expos**, hands-on career explorations for middle school students. Science and math presenters work hard to make their careers come alive for students. The diversity of careers is impressive and includes engineering, water quality, archeology, medical technology, alternative energy, fisheries and forensics, to name a few.

In 2003, the Michigan Women’s Foundation funded a program at the Center called **Work SMART (Science Mathematics And Related Technologies)**. Middle school girls explored home construction careers. They created four displays showing how electricity, plumbing, masonry and carpentry are used inside and outside a house AND what is found within the walls. The house-infrastructure boxes will be on display here during the Smithsonian **Labor Days: History of Work** exhibit this coming August and September.



As part of the **Work SMART** program, the girls practiced construction skills. They framed in a window, tiled a wall, plus wired and plumbed the inside & outside of a “house”.

In 2016, Raven Hill was the only site in Michigan to host a **NASA in Your Neighborhood** event. Over 355 guests enjoyed hands-on NASA activities and our “signature” Eggdrop experience. Visitors were invited to package a raw egg to represent delicate instruments. Pilot Leon Jarema volunteered his services and released the packages from 1000 feet up in the air to simulate NASA landing its equipment on the moon or Mars. The Eggdrop is always a popular **STEM** event at Raven Hill Discovery Center.

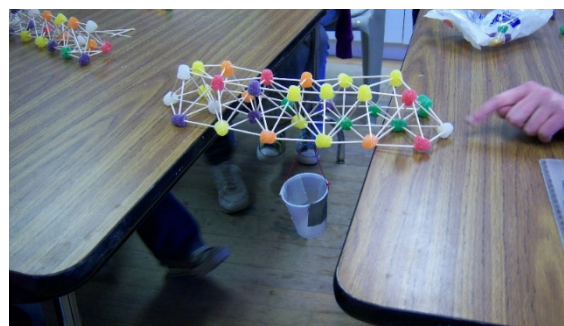
This current school year, teachers can book a **STEM Plus** outreach program that combines STEM and Language Arts skills **outdoors**. Thank you, Charlevoix County & Petoskey-Harbor Springs Area Community Foundations for funding this program. Call Cheri at 231.675.6025 or email [info@miravenhill.org](mailto:info@miravenhill.org) to schedule a date & time.



(Above left) The plane flies over to test the wind direction, before dropping its cargo of 54 Eggdrop packages.



(Above right) Ben Doran smiles at his successful egg drop.



Engineering a bridge that can span a distance and actually support weight is one of the hands-on challenges that career expo participants experience. Meanwhile, presenters share highlights of their career, potential salaries and recommend high school and college classes.



Raven Hill’s **STEM To Go** program allows elementary students to role play different engineering careers, including chemical, aeronautical, mechanical, civil, environmental, electrical and materials engineers.

It has been a long time since the pandemic began and sometimes the progress toward “back to normal” seems slow, but we need to be persistent, until we know for sure that this pandemic is truly under control. Author and speaker, Josh Shipp says this, “perseverance is stubbornness with a purpose.” So, be purposeful and persistent in your actions. Even after you get your vaccine, continue to wash your hands often, wear your masks, socially distance and stay away from crowds. Continue to purposely persevere during this pandemic. Take care and stay safe.

Hugs from a distance,  
Cheri

PS Following is a Smithsonian Activity for **National Engineers Week**.  
Try it with your class or family!

## Smithsonian Activity for **National Engineers Week** **Index Tower**

Building an index card tower is a great chance for students to stretch their engineering muscles. It does not require very many materials and can be easily adjusted to match your time and class. We have listed the materials, quantities, criteria, constraints, and scenario we usually use. You can change any of it to better suit your class.

### **Materials:**

For the group

- 50 index cards
- Tape, 12 in
- 1 Stuffed animal/ water bottle/ artifact

For the teacher

- Measuring tape
- A stuffed animal, water bottle, or other object act as the artifact

### **Criteria:**

- The tower must hold the artifact for (number of seconds determined by group)
- The tower needs to be 30 cm (12 in) high

### **Constraints:**

- You may only use the cards and the tape.
- You can tear the cards.

### **Prompt:**

At the Smithsonian, we use physical items of historic or scientific importance, called artifacts, to share information with people around the world. One way we do that is to create exhibitions so people can see the artifact. Today we are going to design an exhibition for this artifact. (Display whatever your artifact will be-- stuffed animal, water bottle, or other object.) What are some things we need to consider for our exhibition? (This is where you will create your criteria and address constraints. If you create them as a class, you are more likely to have better student motivation and buy-in.)

Once your class has decided on appropriate criteria and constraints, give the groups some time (5–10 minutes) to discuss possible solutions and to come to a consensus on the best solution. Once your groups have a plan, hand out the materials for them to prepare to build. We usually go with 15–20 minutes of build time. After the build time ends, you will test all of the towers to see if they meet the criteria. Depending on time, allow groups to rebuild to improve their design or discuss what changes they could make in future attempts.



Tower designed by a team at the 2018  
STEM Forum hosted by Dow, Jacobs, and  
the SSEC in Lake Jackson, TX.  
(Image: Dow)