Minnesota Mission Log



Challenger LEARNING CENTER MINNESOTA

Newsletter: Summer 2016

7th Annual STEM Day at the Minnesota State Fair

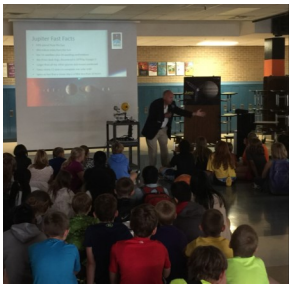
It has been a great summer for the Challenger Learning Center of Minnesota! We have met so many supportive members of the community at events like the AirExpo and the Minnesota State Fair STEM Day! The 2016 Minnesota State Fair kicked off with the 7th annual STEM (Science, Technology, Engineering and Mathematics) Day on Thursday, August 25th. Over 30 exhibitors from the Minnesota STEM network displayed hands-on science including robots, rockets, math and engineering challenges, architecture, computer coding and more.



We were honored to be selected as one of the exhibitors as it embodies the spirit of our mission here at the Challenger Learning Center of Minnesota—to inspire and educate the youth of our area! At our booth, kids were able to test out the principles of aerodynamics with paper airplanes and try out our Space Shuttle flight simulator. We appreciate all the kids, parents and educators who stopped by our booth to learn more about our mission and how we are going to make a lasting impact on our communities. Thank you to our awesome team and a special thanks to CAPmation for sponsoring our booth. If you missed the 2016 STEM Day, make sure to mark your calendars for STEM Day 2017!

NASA's Juno Mission to Jupiter

Thanks to NASA's Jet Propulsion Laboratory, we had the opportunity to speak to 200 middle school students on June 30th about NASA's current Juno mission to Jupiter and leave them with some cool materials to take home! Amazing things like the Juno spacecraft present us with great opportunities to excite our youth and hopefully peak their interest in STEM. The Juno spacecraft arrived at Jupiter on the evening of July 4th after an almost 5 year journey through the solar system. Read more about the incredible spacecraft and record-breaking Juno mission on page 3 of this newsletter. A special thanks to our own board member, Dr. Terry Flower, a NASA/JPL Solar System Ambassador, and Valley Middle School in Apple Valley, Minnesota.



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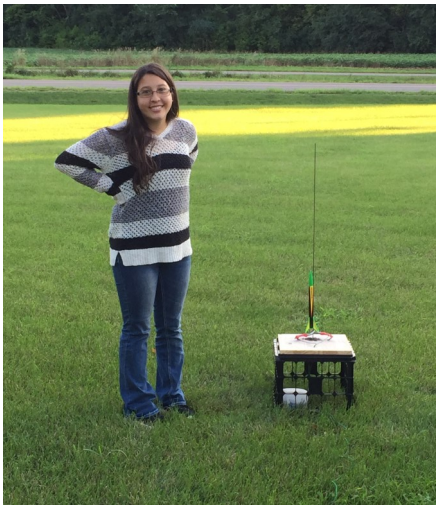
In The News

Star Party & Make-A-Wish Night

We were honored to host a Star Party (star gazing party) for members of the Challenger Learning Center of Minnesota and local Make-A-Wish recipient, Victoria, and her family at the end of July. In March 2016, our board member, and six time NASA astronaut Curt Brown, had lunch with Victoria and presented her with VIP access to our summer's Star Party. Before we brought out the telescopes for star gazing, we helped "prep" Victoria for her big wish trip to Space Camp. We had several fun activities lined up for her including rocket building and a call with Astronaut Susan Helms for some fun Q&A regarding her missions in space.



We teamed with Space Camp to surprise Victoria with a few gifts and a Space Camp flight suit for her trip. To top it off, the weather ended up cooperating so we were able to launch a few rockets and have Dr. Terry Flower lead us on a tour of the night sky including viewing the moons of Jupiter and the rings of Saturn!

A very special thank you to Astronaut Susan Helms, Space Camp and Dr. Terry & Margaret Flower for making the special evening possible!

Update: We heard from Victoria's mom after her trip to Space Camp in early August - Victoria had an incredible week and wants to go back next summer! Keep up the good work Victoria!

Perseid Meteor Shower

Did you catch the annual Perseid Meteor Shower at the beginning of August? This year's meteor shower proved to be the most spectacular show in over a decade, with over 200 meteors per hour under ideal conditions! This year's Perseid's were extra spectacular because Jupiter's gravity has pulled the debris stream in such a way that Earth collided with the middle of the stream, rather than the edge, creating more meteors for us to see compared to other years!

If you missed this year's Perseid Meteor Shower, make sure to put it on your calendar for next year! The meteor shower happens around the same time every year as the Earth passes through the debris field left from comet Swift-Tuttle, that occurred hundreds if not thousands of years ago. In 2017 it will peak around August 12th and 13th, with meteors visible from the end of July through the end of August.

Cool Fact - The meteors enter the Earth's atmosphere at roughly 133,200 mph and are the size of a grain of sand!

In The News

NASA's Juno Mission to Jupiter

As mentioned on Page 1, NASA launched the Juno spacecraft to study our largest planet, Jupiter, with the mission to improve our understanding of giant planets' formation and evolution by studying Jupiter's origin, interior structure, atmospheric composition and dynamics, and magnetosphere.

NASA launched the spacecraft on August 5, 2011, and after almost a 5 year journey through the solar system, it entered Jupiter's gravitational pull on July 4, 2016. The Juno spacecraft traveled 1.8 BILLION miles in it's 5 year journey! Juno will study Jupiter for almost 19 months before it de-orbits into Jupiter's atmosphere in February 2018 (FYI—"De-orbit" is NASA's nice way of saying—we are going to crash into a planet!).

This mission is historic in many ways:

- First space mission to operate a solar-powered spacecraft to Jupiter
- Farthest solar powered spacecraft from Earth
- First space mission to fly as close as 2,600 miles to Jupiter's cloud tops
- First mission to be designed to operate in the heart of Jupiter's radiation belts
- First spacecraft to fly 3D-printed titanium parts
- Will be the fastest spacecraft to enter orbit around a planet, at 165,000 mph relative to Earth
- Will take the highest-resolution images of Jupiter in history

Solar Powered Spacecraft

The Juno spacecraft needs electricity to power it's instruments - but we can't run an electrical cord all the way from Earth to Jupiter! But we can use the sun to create electricity using solar panels. So the engineers designed Juno to carry the largest solar panels in the universe - each of the three solar panels are 34 feet long! The Juno mission officially **broke the record** to become human's longest distance solar-powered spacecraft - that is pretty cool! It also set a **new speed record** for the fastest moving human-made object in history, traveling over 165,000 mph!

JunoCam - Onboard Public Camera

The coolest feature might be the JunoCam—a camera onboard the spacecraft that we, the public, can vote on to tell NASA where to point it and what to capture! Voting starts in November 2016. Follow https://www.missionjuno.swri.edu/junocam for more details.

How Can You Help?

> Visit our website for more information and contact us to learn how you can get involved.

> Sign up for an individual or Family Membership, or consider a donation - information on the website: www.challengermn.org/membership.html

> Help us get the word out!

Challenger® LEARNING CENTER MINNESOTA

"Your vision is not limited by what your eyes can see, but by what your mind can imagine."

-Ellison Onizuka, Challenger Astronaut

SpaceX Update

Astronauts to Mars by 2024!?!

In September 2016, SpaceX will reveal their plans to send astronauts to Mars by 2024, starting with an unmanned launch of their Dragon spacecraft to Mars in 2018 to pave the way. NASA will cooperate on the project by providing technical expertise in exchange for data obtained from the Mars landing.

SpaceX CEO, Elon Musk, said "The basic game plan is that we're going to send a mission to Mars with every Mars opportunity from 2018 onwards". Launch windows for Mars missions open every 26 months. The next launch window will occur in the spring of 2018. "We're establishing cargo flights to Mars that people can count on," Musk said. "I think if things go according to plan, we should be able to launch people probably in 2024, with arrival in 2025. We look forward to hearing more about their plans in September!

Reusable Rockets

A fundamental difference that sets SpaceX apart is their belief that a reusable rocket is the pivotal breakthrough needed to significantly reduce the cost of space travel. In August 2016, SpaceX successfully landed the first stage of a Falcon 9 rocket on a floating barge for the THIRD time in a row, and for the fourth time overall. They have also successfully completed two ground landings at Kennedy Space Center. The next step is for SpaceX to now re-fly these boosters that it has landed, which they plan to do in early 2017. Stay tuned!

Family Science Experiment: Sugar Rainbow!

It's easy to stack boxes and books - but can you stack LIQUIDS?? To learn about the density of liquids, it is fun to see how different glasses of sugar water stack on top of each other depending on how dense they are. Density is the measurement of how much "stuff" is packed into a measured space. We can find the density of any object by this equation: Density = Mass (stuff) ÷ Volume (measured space). Nearly every substance on Earth has a different density. And this is also true for the sugar and water mixtures you will make during this experiment.

You will need:

- four different colors of food coloring
- five tall glasses or clear plastic cups
- ¾ cup of granulated sugar
- a tablespoon for measuring
- 1 cup of water

Prepare the Rainbow: In the first glass, add one tablespoon of sugar. In the second glass, add two tablespoons of sugar, three in the third glass, and four in the last glass. Then add three tablespoons of water to each glass, and stir until the sugar is dissolved. If the sugar in any of the glasses will not dissolve, add one more tablespoon of water to ALL of the glasses, and stir again. When the sugar is completely dissolved, add two or three drops of food coloring to the following glasses: red to the first glass, yellow to the second, green to the third, and blue to the last glass.

Mixology: Finally, in the remaining glass we will create our rainbow! Fill the glass about a fourth of the way with the blue sugar solution. Next, carefully add the green solution to the glass. Do this by putting a spoon in the glass, just above the level of the blue solution. SLOWLY pour the green solution into the spoon, raising the spoon to keep it just above the level of the liquid, until the glass is half full. Add the yellow solution, and then the red one in the same manner.

What's really happening? The amount of sugar dissolved in a liquid affects its density. The blue solution has the most sugar dissolved in it and therefore is the most dense. The other solutions are less dense than the blue solution, so they float on top of it. The densities are very close, but if done carefully enough, the colors should stay relatively separate from each other. As the Sugar Rainbow reveals, a solution with a low density stacks on top of a mixture with a high density.

Hypothesis: What do you think will happen if you stir up the liquids in the glass?