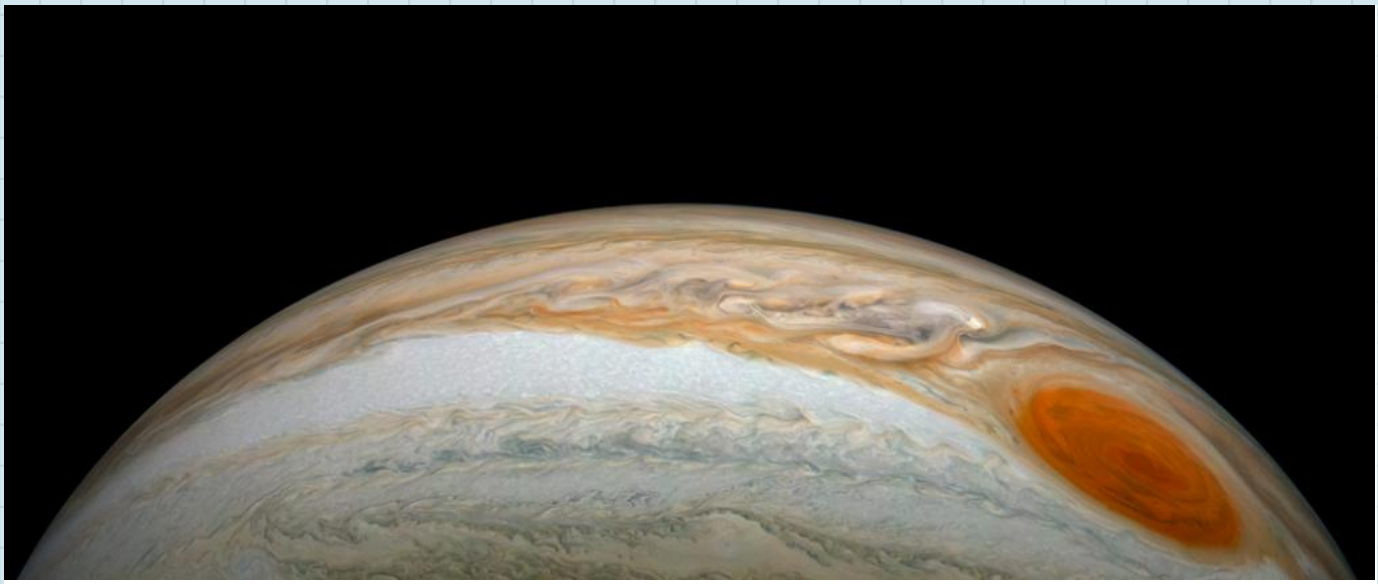


WELCOME

BACK TO SCHOOL!

REAL WORLD RESOURCES FOR EDUCATORS TO INSPIRE STUDENTS

IN THIS NEWSLETTER EDITION

SEPTEMBER 2019

NEW VIDEO RESOURCES

NASA eClips™ Educational Videos

- **Real World: Computer Simulations - Turning Complex Ideas into Solvable Equations**
- **Real World: From Idea to Physical Prototype**

NASA SPOTLITE DESIGN CHALLENGE

Science *for* Students *by* Students

Are your students interested in becoming Science Content Creators? They could be featured on nasaeclips.arc.nasa.gov!

SUMMER NEWS & ACTIVITIES

Get caught up and have some fun!

- **SpaceX's Falcon Heavy July Launch - Learn about NASA's Deep Space**

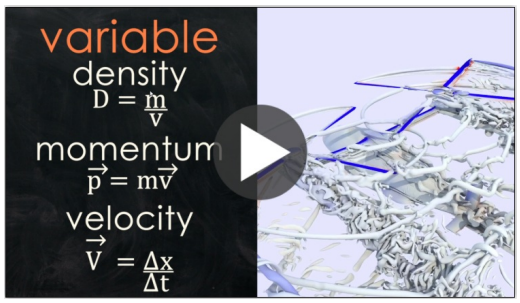
Atomic Clock

- **Our World: Shower Clock Engineering Design Challenge educator guide**

NEW! MODELING AND SIMULATION VIDEOS

Real World: Computer Simulations - Turning Complex Ideas into Solvable Equations

How does NASA test ideas, like the Mars Helicopter, before they are even built? Find out more about this revolutionary helicopter and how NASA uses mathematical modeling to turn complex ideas into solvable equations to help shape future missions.



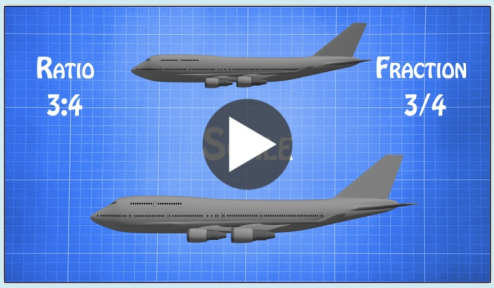
Watch the video **here**.

RELATED RESOURCES:

My NASA Data offers global Earth science data collected from satellites that can be used by classroom teachers and students for authentic data analysis. My NASA Data also provides mapped visualizations and a data visualization tool (Earth System Data Explorer), as well as lesson plans and activities. Students will construct Data Literacy Cubes that can be used to foster mathematics and computational thinking. Cubes are available for analyzing maps, graphs, and data. Each type of cube has differentiated questions to scaffold learners in their analysis.

The **Katherine G. Johnson Computational Research Facility** was dedicated on September 22, 2017. Katherine Johnson was a "human computer" who worked at NASA's Langley Research Center from 1953 until her retirement in 1986.

She is known for her calculations of trajectories for America's first spaceflights. The $23 million, 37,000 square foot building will advance Langley's capabilities in modeling in simulation as well as data analysis.



Watch the video **here**.

Real World: From Idea to Physical Prototype

At NASA, everything begins with an idea. Physical models help NASA engineers and technicians test those ideas before building full-scale versions. Learn more about the important role physical modeling, building prototypes, and mathematics play in engineering solutions.

RELATED RESOURCES:

NASA's Langley Research Center houses many different wind tunnels (Vertical Spin Tunnel, Transonic Cryogenic Tunnel, High Temperature Tunnel, Transonic Tunnel, and Low-Turbulence Pressure Tunnel) that researchers have used to better understand the forces acting on an object as it moves through the atmosphere, how to minimize noise made by aircraft, and how to optimize engine efficiency. In addition to testing aircraft, these tunnels have been used to test spacecraft, automobiles, ships, trucks, and wheelchairs.

NASA's Space Place: **Make a Topographic Map**!
Students can use clay to construct a mountain and valley and then convert their physical model into a topographic map.

What do topographic maps have to do with space? Scientists use a technology called imaging radar to help create a picture of the terrain on Earth, or any other planet! The Shuttle Radar Topography Mission (SRTM) flew aboard the Space Shuttle Endeavor in February 2000. It made radar images that scientists will use to make the best topographic map ever made of Earth.
For more activities, visit: **https://spaceplace.nasa.gov/**.

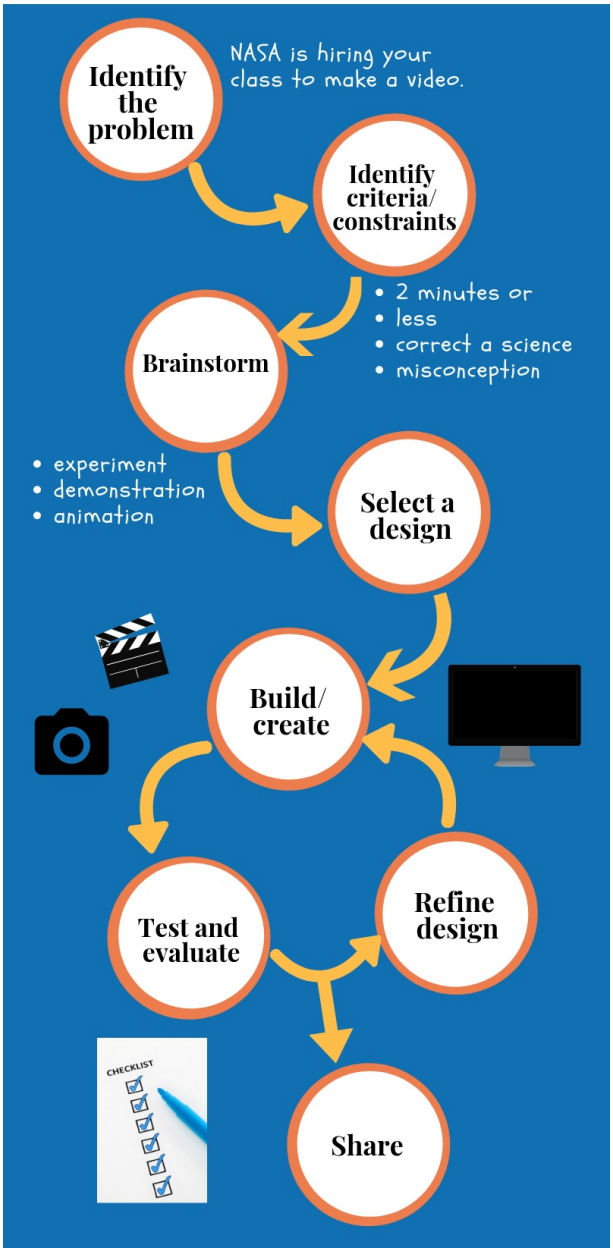
NASA SPOTLITE DESIGN CHALLENGE

Use the NASA Spotlite Design Challenge to increase students' science literacy and communication skills. From research, to script, to screen, students build their own understanding of science concepts through creative video representations. This project may be used by digital media, science, and English teachers as an authentic, interdisciplinary task.

Are you ready? Just be sure to follow the **Design Challenge Step-by-Step Outline**! You can view all of the NASA Spotlite videos **here**.

NASA SPOTLITE
Science for students by students

Design Challenge



SUMMER NEWS & STUDENT ACTIVITIES!

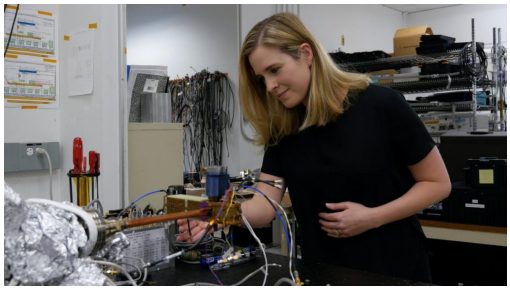
On June 25, 2019, a SpaceX Falcon Heavy Rocket successfully launched and carried 24

satellites from NASA's Kennedy Space Center!

NASA's Deep Space Atomic Clock, a toaster oven-sized instrument, is traveling aboard one of those satellites. Introduce your students to this unique atomic clock by sharing the **5 Things to Know about NASA's Deep Space Atomic Clock**!

Challenge your students to engineer and precisely calibrate their own clocks by following the **Our World: Designing a Shower Clock** educator guide.

Meet **Dr. Jill Seubert**, an interplanetary navigator at NASA's Jet Propulsion Laboratory in California. Jill always wanted to explore far off worlds of her own and her work on the *Deep Space Atomic Clock* will help make a difference in the way we explore.



Watch the video and meet Dr. Jill Seubert **here**!

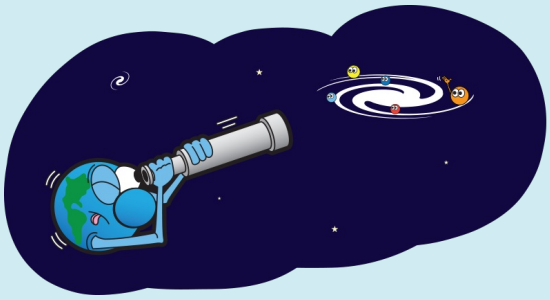
Meet **Todd Ely**, a space navigator, and the Principal Investigator for the *Deep Space Atomic Clock* at NASA's Jet Propulsion Laboratory. Todd is opening up new ways to navigate in space that will be critical for human exploration of the solar system.

Watch the video and meet Todd Ely **here**!

Save the Dates!

FREE! 'Just in time' Workshop series 2019-2020
"Learn it Today, Use it Tomorrow"

NASA's Langley Research Center Science Directorate and the National Institute of Aerospace's Center for Integrative STEM Education will offer 3 Saturday Professional Development workshops to support science teachers of grades 6 through 12. A certificate documenting PD hours of participation will be provided for each session attended.



Explore student-centered Earth systems science using NASA data and education resources.

Attend one or all of the following sessions:
Saturday, October 5, 2019 - Topic: **Air Quality: "The Air We Breathe"**
Saturday, November 2, 2019 - Topic: **Weather: "How Much is Too Much"**
Saturday, March 21, 2020 - Topic: **Carbon Cycle: "Trees Around the World"**

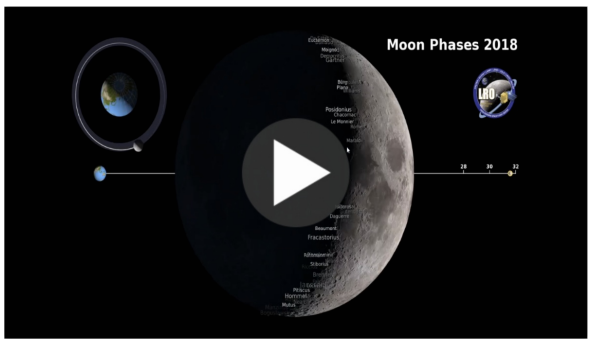
TIME:
8:30 AM - 12:00 PM

LOCATION:
National Institute of Aerospace
100 Exploration Way
Hampton, Virginia 23666

Questions or Comments?
Contact Joan Harper-Neely (joan.harper-neely@nianet.org) or Elizabeth Joyner (elizabeth.r.joyner@nasa.gov).

CLICK HERE TO REGISTER!

If you missed our previous newsletter, check out these videos!



Our World: Moon Phases

What causes the phases of the Moon? From New Moon to Full Moon, the Earth-Sun-Moon system is responsible for the Moon's changing phases. Learn more about rotation, revolution and this repeatable pattern.

Watch the video **here**.

Our World: The Moon's Impact on Earth

The Moon impacts Earth through tides and moonlight. NASA missions to the Moon continue to help us discover more about our nearest neighbor. Learn more about Moon mapping and resources.

Watch the video **here**.