Look Up! Explore Our Universe:

The James Webb Space Telescope Challenge

CHALLENGE DESCRIPTION

Explore our universe with the James Webb Space Telescope Challenge. Learn all about the science behind NASA's newest space telescope mission, the James Webb Space Telescope. Scheduled to launch this winter, JWST is the most advanced infrared space telescope ever launched and will allow us to look deeper into time and space than ever before!

Help your library win a collection of programming materials from NASA @ My Library by logging your reading and completing activities. Earn new badges all month long!

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CHALLENGE STRUCTURE

1 Registration Badge
1 Completion Badge
10 Minutes Logging Badges
5 Activity Badges

ACTIVITY BADGES

Activity Badge 1
Reading Recommendations

Badge Description
Explore Earth and space science reading recommendations for all ages. Log your reading throughout the challenge.

Activities
- Check out Earth and space science book recommendations! Which book did you choose? ***(text box)***
    - Look Up! Explore Our Universe Booklist

Activity Badge 2
What is the James Webb Space Telescope?

Badge Description
The James Webb Space Telescope is scheduled to launch this winter! JWST is the largest telescope ever sent into space and will allow us to see further into space and time than humanity ever has before. Learn more about JWST and explore the science behind the space telescope by completing two of the six activities below to earn this badge!

Activities
- What is the James Webb Space Telescope? Watch this short video all about the world's largest orbital telescope and its mission.
    - James Webb Telescope: An Overview

- JWST has many unique features that make it the largest and most advanced space telescope ever launched. Read about some of these features in this article.
    - Space Place: What is the James Webb Telescope?

- JWST will require a specialized rocket called the Ariane 5 to launch it into space. Build your own small-scale straw rocket with this activity.
    - Jet Propulsion Laboratory: Make a Straw Rocket

- JWST took 25 years to go from the design to launch stages. Design and build your own space telescope spacecraft from found objects in this activity.
    - Build your own satellite!

- JWST has a 21-foot-wide primary mirror made up of 18 individual, hexagonal, gold-plated mirrors. It will use its large primary mirror to help it capture light from faraway stars. What colors will JWST see in space? How would you color JWST? Print and color this coloring sheet or use it as inspiration to draw your own space telescope.
    - James Webb Telescope coloring sheet

- What have you enjoyed learning about most so far? ***(text box)***

Activity Badge 3

Find Faraway Worlds

Badge Description

Part of the James Webb Space Telescope's mission is to look for exoplanets – planets that orbit other stars in different solar systems. The number of known exoplanets continues to increase as we launch more high-powered robotic telescopes like JWST into space. Learn more about these distant worlds by completing two of the eight activities below to earn this badge!

Activities

- JWST hopes to answer questions about planets in our own solar system and beyond. Watch this video about what scientists hope to learn from the observations JWST will make about our planetary neighbors and planets outside our stellar neighborhood.
    - Planetary Studies: James Webb Space Telescope Science

- How do we find exoplanets? Head to NASA's Space Place to find out how previous NASA missions like the Kepler space telescope have looked for distant worlds.
    - What is an exoplanet?

- Interested in visiting an exoplanet? Visit NASA's Exoplanet Travel Bureau to see what artists think previously discovered exoplanets might look like and learn more about the observatories that found them.
    - Exoplanet Travel Bureau

- What do you think exoplanets might look like? Print and color these coloring pages or use them as inspiration to draw what you think an exoplanet surface might look like.
    - #ColorWithNASA: Exoplanet Coloring Pages

- Want an exoplanet of your very own? Grab some smooth rocks and acrylic paint and design your own exoplanet with this activity.
    - East Crafts from NASA: Make Your Own Exoplanet

- You don’t need a telescope to study space. Go outside this month and find the constellation Orion. The nebula in Orion's belt is a baby star nursery.
    - Sky & Telescope: The Essential Guide to Astronomy

- Just how big are stars, planets, and moons? Try our online Sizemology game to see.
    - Sci Games: Sizemology

- What type of exoplanet would you like to visit? ***(text box)***

Activity Badge 4

Different Types of Light

Badge Description

The James Webb Space Telescope will observe distant objects in our universe using infrared radiation, a type of light that is invisible to the human eye but can be felt as heat. JWST will use its infrared cameras to see through our universe’s dust-filled clouds, where stars and planets form. Learn more about the different types of light in the universe by completing two of the seven activities below to earn this badge!

Activities

- What types of light are there? Watch this musical video to learn about the different types of visible and invisible light on the electromagnetic spectrum.
    - Electromagnetic Spectrum The Musical

- Why does JWST measure infrared light? Find out how the infrared light JWST measures differs from the broad spectrum of light measured by the Hubble Space Telescope and what that can tell us by watching this video.
    - Hubblecast 126: From Ultraviolet to Infrared

- Want to see different parts of the electromagnetic spectrum yourself? Explore what makes the sky blue and the sunset red with this activity.
    - Science Snacks: Blue Sky

- Want to see how different types of light can affect things here on Earth? Complete this activity to measure the effects of ultraviolet light using your hands, sunscreen, and colored paper.
    - Sci Games: Sunscreen & UV Rays

- Where is all this light coming from? Stars! But it turns out that it’s quite a journey for light to get from the center of a star to the surface. Try our Solar Maze game and help light escape from the core of a star.
    - Sci Games: Solar Maze

- Light from the sun can get in our way when we're studying space, but there's one astronomical object besides the sun that you can still see in the day: the moon! This site will show you the current moon phase. If it's in the first or last quarter phase, you can see it during the day! Scroll to the bottom of the page to make your own moon chart to predict when you'll see a daytime moon.
    - Moon in Motion

- What spectrum or color of light is your favorite? ***(text box)***

Activity Badge 5
Gathering Galactic Data

Badge Description
As part of its mission, the James Webb Space Telescope will gather data on how galaxies form and evolve over time, providing new insights about the history of the Milky Way galaxy we call home. Learn more about the galactic science that JWST will perform by completing two of the five activities below to earn this badge!

Activities
- What is a galaxy? Head to NASA's Space Place to read about what makes a galaxy a galaxy.
    - Space Place: What is a Galaxy?

- How do newborn galaxies form? Watch this video to find out more about how JWST will allow us to learn all about the earliest stages of galactic formation.
    - Galaxy Evolution

- Want to hold a spinning galaxy in the palm of your hand? Complete this craft activity to make your own pinwheel galaxy.
    - Sci Games: Pinwheel Galaxy Craft

- What kind of galaxy would you want to live in? Design your own galaxy using construction paper and coffee filters with this activity.
    - Galaxy Montage Activity

- What types of things would you put in your own newborn galaxy? ***(text box)***