Pre-Visit Information: Observatory Solar Viewing Experience – 5th Grade

Standards to Build On:

South Carolina College- and Career-Ready Science Standards 2021: 5-ESS1-1

Next Generation Science Standards: 5-ESS1-1

What's this all about?

See a live image of the Sun (weather permitting) from our observatory telescope! If it's cloudy, we have lots of cool pictures from our telescope to show. For our 5th grade solar viewing program, we focus on the Sun and other stars' apparent brightness and distance from Earth.

What's going to happen?

Students will interact with our astronomy educators over a virtual platform such as Zoom or Google Meet. We'll begin by introducing our telescope, and then we'll show a live image of the Sun (or a Sun picture we've taken in the past if it's cloudy). As we're showing our image and discussing the Sun, we'll interact with the students through back-and-forth conversation. Because this program is interactive, we encourage classes to stay unmuted if possible.

Following our discussion of the Sun, we'll show some amazing nighttime images of nebulas and star clusters from our telescope. The last 5-10 minutes of the program are devoted to student Q&A. If students remain seated during Q&A, teachers may need to repeat students' questions so that our educators can hear them over Zoom/Google Meet. If students are comfortable, they are also welcome to come up to the classroom computer and ask their questions directly.

Key terms/concepts we may cover include:

Telescope
Sun
Star
Sunspot
Nebula
Sizes of stars
Distances to stars
Star colors

Things you can do before the program:

Activity 1: Introduce the terms “Sun” and “star.” Double-check that students know that the Sun is a star. It’s just like the stars we see at night, except that the Sun is much closer. Explore the differences between apparent brightness (the brightness of a star as seen from Earth) and absolute brightness (the actual, intrinsic brightness of a star).

Extension: Astronomers measure the absolute brightness of a star by calculating its apparent brightness from a pre-set distance. This distance is usually 32.6 light years, or 10 parsecs (1 parsec = 3.26 light years). To learn more, check out https://lco.global/spacebook/distance/what-absolute-magnitude/.

Activity 2: Try making a human sundial with sidewalk chalk!
- Basic instructions can be found here: https://www.crayola.com/lesson-plans/human-sundial-lesson-plan/
- More details and background info are available here: https://www.sciencefriday.com/educational-resources/a-human-sundial/

Activity 3: Ask students to go outside with their caregivers on the next clear night and simply look up at the night sky. What’s the same about each of the stars you see? What’s different?

Note: It’s completely understandable that some students may have trouble observing the night sky from where they live. Light pollution, trees/buildings in the way, and safety concerns with being out at night can make night sky observing challenging. There could also be a string of cloudy nights around the time of your program. To support students in doing this activity, our Observatory Manager can help you obtain and use a free program called Stellarium.

Helpful links:

SCSM observatory virtual program FAQs:
https://scmuseum.org/astronomy/observatory/observatory-educators#virtual-programs

Current images of the Sun from the National Solar Observatory:
https://gong2.nso.edu/products/tableView/table.php?configFile=configs/hAlpha.cfg

Solar Dynamics Observatory (SDO): This page is constantly updated with amazing Sun images from NASA’s SDO satellite: https://sdo.gsfc.nasa.gov/

Space Weather: This is our favorite website for keeping track of sunspots, solar flares, and solar storms that could affect us here on Earth: https://spaceweather.com/

Stellarium: This night sky simulation program is available as a free download: https://stellarium.org/