Pre-Visit Information Observatory Solar Viewing Experience – 8th Grade

Standards to Build On:

South Carolina College- and Career-Ready Science Standards 2021: 8-ESS1-1, 8-ESS1-2, 8-ESS1-3

Next Generation Science Standards: MS-ESS1-1, MS-ESS1-2, MS-ESS1-3

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 8th grade solar viewing program, we also incorporate images from NASA and other observatories. This helps us cover some of the deeper astronomy topics in the *South Carolina College- and Career-Ready Science Standards 2021* and Next Generation Science Standards.

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 from our telescope, followed by images from NASA and other observatories. 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:

Light-year
Planets
Moons
Sun and stars
Eclipses
Gravity and motions within galaxies and the solar system
NASA solar system exploration (unmanned spacecraft)
Black holes
Nuclear fusion and how stars generate energy

Things you can do before the program:

Activity 1: Review the following concepts:
- The Sun is a star, just like the stars we see at night. It looks so much bigger/brighter because it is much closer to us than the stars in the night sky.
- Scientists observe planets in our solar system with both ground-based telescopes and unmanned space probes.
- Gravity holds the planets in our solar system in orbit around the Sun.

Activity 2: Ask students to try one or more of the following:
- We have several images of the Sun taken from the SCSM observatory available on our website. Have students look at these images and identify/label solar features (sunspots, prominences, filaments).
- Make a sketch of a telescope and label the parts. It's completely OK if your sketch and labeling isn't perfect…this is more to get you thinking about how telescopes work.

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? All of the stars we see at night are part of the same galaxy. What's the name of that galaxy?

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

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

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