William M. Staerkel PLANETARIUM

Teacher's Guide to

"Season of Light"

OBJECTIVES:

- To investigate why the Sun is at different heights at noon during the year
- To investigate how different cultures interpreted the changing Sun height
- To illustrate how different cultures celebrated the winter solstice

This show conforms to the following NGSS: 1.ESS1.1, 1.ESS1.2 , 5.ESS1.2 , HS.ESS1.4

BRIEF SHOW DESCRIPTION:

"Season of Light" traces the history and development of many of the world's holiday customs, all of which involve lighting up the winter season "Seasons of Light" also recounts the historical religious and cultural rituals practiced during the time of winter solstice - not only Christian and Jewish, but also Celtic, Nordic, Roman, Irish, Mexican and Hopi. It also takes a look at some of our more light-hearted seasonal traditions like Kris Kringle.

PRE-VISIT ACTIVITIES/TOPICS FOR DISCUSSION:

- "Season of Light" is a great opportunity to talk about the seasons. Discuss what makes it cold in the winter and hot in the summer? A very common answer is that the Earth is farther from the sun in the winter when actually we're closest to the Sun in January! Use the images of the Sun near the bottom of this page (http://web.kpc.alaska.edu/astronomy/lecture/lecmove.htm) to show that the Sun is actually a bit closer (it looks larger) in January.
- Measure the length of a shadow of a post near your school near noon. Then repeat the measurement two weeks later. Is the shadow longer? Shorter? The same? As long as you're not measuring around the solstices, you should see a difference. Shadows are longest near the end of December and shortest near the end of June.
- Have the class note when the Sun rises and/or sets through the school year. It is not in the same spot! Maybe even mark this in the classroom by standing in one spot and marking it on the window or marking the shadow of an object in the window.
- Is the length of daylight the same? Discuss how we usually eat dinner with the lights on in December but it gets dark very late in June. You can illustrate this using a free download of a program called Stellarium (www.stellarium.org). If the Sun sinks lower and days get shorter, what is to keep it from going below the southern horizon? What could we do to entice it to come back?

POST-VISIT ACTIVITIES/TOPICS FOR DISCUSSION:

- Assign each member of the class a different culture and research how they kept track of seasons and prepared for the winter solstice. IF you were going to create a new tradition, what would it be?

VOCABULARY LIST:

Solstice	Yule
Equinox	Planetary Conjunction
Kalends	Maji/Zoroastrianism

INTERNET RESOURCES:

- Solstice traditions: https://www.rd.com/culture/winter-solstice-traditions/ or https://www.history.com/topics/natural-disasters-and-environment/winter-solstice or https://www.timeanddate.com/calendar/december-solstice-customs.html
- Ways to celebrate the solstice: https://rhythmsofplay.com/ways-to-celebrate-the-winter-solstice-2/
- More solstice: https://en.wikipedia.org/wiki/Winter_solstice
- History of Hanukkah: https://www.history.com/topics/holidays/hanukkah or https://www.myjewishlearning.com/article/hanukkah-history/
- 8 facts about the solstice (from 2018 but still appropriate): https://www.vox.com/science-and-health/2018/12/18/18144477/winter-solstice-2018
- When was Jesus born? https://www.livescience.com/42976-when-was-jesus-born.html or https://en.wikipedia.org/wiki/Date_of_birth_of_Jesus
- More on Jupiter's triple conjunction in Leo: http://www.askelm.com/star/star004.htm