**Stellarium Sky Viewing Tutorial Transcript**

[Music]

Open the sky viewing software by going to stellarium-web.org. Use the hamburger icon in the upper left corner to close the menu. Find the timestamp tool at the bottom right of your screen. Select and open this tool. There are two ways to adjust time within this tool. Use the slider and drag it back and forth until you find the time of day you want to observe or use the arrows to change the date or the time of day by hours, minutes, or seconds. You can turn the constellation lines on and off. Look toward the horizon and you can see different cardinal directions of north, south, east, and west. You can turn the atmosphere on and off. You can turn the landscape on and off; however, I would not turn the landscape off as it's very hard to figure out where you are. Now that you have had a chance to practice using the sky viewing software let's review the student Star Guide activities. Students use Stellarium in lesson 3. This section explains how students use Stellarium during activity steps 11 to 16 of the teacher guide. Students can follow these directions in the lesson 3 section of the Star Guide. Organize students into groups of four students. Within each group organize students into two pairs of students. Assign or let each pair choose one of the following pairs of objects to observe: Ursa Minor and Cepheus or Orion and the Moon. Hand out a device with internet access, two pieces of paper, and a Star Guide to each group. Ensure students turn the constellation lines on. Then they should set the date to December 27th 2023 and the time to 1800 hours military time or 6 p.m. Have students follow directions in the Ursa Minor and Cepheus box or Orion and the Moon box to observe their assigned constellations. Ensure students that are assigned Ursa Minor or Cepheus are facing north. Have them find the constellations Ursa Minor and Cepheus. Next have them open the time tool at the bottom right of the screen and advance the time hour by hour to show how these constellations move throughout the night. As students advance the time they should observe how the constellations move across the sky. One student should draw Ursa Minor on one piece of paper and the other student should draw Cepheus on another piece of paper. On each drawing students should draw a line to represent the horizon. Label north on the horizon and draw and label Polaris. Draw their constellation at 1900 hours 2300 hours and 400 hours. Label the time of each drawing. Write the name of the object at the top of their paper. Students will do a similar drawing for the constellation Cepheus. Ensure students that are assigned Orion or the Moon are facing south. Have students zoom out so they can see east, south, and west. They should then find the objects they were assigned Orion or the moon. Open the time tool at the bottom right of the screen and advance the time hour by hour to show how Orion and the moon appear to move throughout the night. One student should draw the Moon on one piece of paper and the other student should draw Orion on another similar to what they did with Cepheus and Ursa Minor. On each drawing students should draw a line to represent the horizon labeling east, south, and west. Draw the Moon or Orion's belt at 2100 hours, 100 hours, and 500 hours. Label the time of each drawing, and write the name of their object at the top of their paper. Students will do a similar drawing for the constellation Orion. Students use Stellarium in lesson 10. This section explains how students use Stellarium during activity steps 3 through 10 of the teacher guide. Students can follow these directions in the lesson 10 section of the Star Guide. If you haven't done so already open the Stellarium application by going to stellarium-web.org and project it at the front of the class. Organize students into groups of four. Assign students one of the eight constellations you listed on the board. Each group should have a different constellation. Split each group of four students into two pairs. Note that students will return to their group of four later in this lesson. Hand out a device with Stellarium open in the browser, a Star Guide, lesson 10 activity sheet to each pair of students. To begin this activity ensure students turn the constellation lines on. Next, students should open the time tool and set their date to the 15th of the current month. Have students start right before sunset and find their constellation. For example let's observe Cancer. Have students advance their time by the hour and observe when their constellation is first visible and last visible. For example Cancer is first visible on this day at 100 military time. Have students record the time their constellation is first visible in the night sky round to the nearest hour use military time. Have students advance the time hour by hour and observe when the constellation is last visible. Remind students that although they can see the outline of their constellation after the sun rises, Stars are not visible after the sun rises. For example Cancer is last visible on this day around 700 military time. Then have students record the time their constellation is last visible in the night sky. Count how many hours their constellation is visible for each month. This is tricky because the time resets to zero military time at midnight. Try counting on your fingers. Students continue observing their constellation on the 15th day of each month. Students use Stellarium in lesson 14. This section explains how students use Stellarium during activity steps 7 through 9 of the teacher guide. Students can follow these directions in the lesson 14 section of the Star Guide. If you haven't done so already open the Stellarium application by going to stellarium-web.org and project it at the front of the class. Organize students into pairs assign each pair to one of the six remaining objects in the which objects are most useful for navigation chart. Make sure that each object is chosen or assigned to at least one group. Hand out a device with Stellarium open in the browser, a Star Guide, and lesson 14 activity sheet to each pair of students. Remind students where to find the time tool and have them set the date to March 21st 2024. Have students find their object they can use the search feature if needed let's use Vega as an example. Students should change the time and view until they find the time and location that their object rises. For example Vega rises in the northeast around 2300 military time on this day. Ensure they record the time and location on their activity sheet. If their star is not visible when it rises because it is daytime have them write not visible across the time and location for that date students should change the time and view until they find the time and location that their object sets. In the case of Vega on this day, the sun rises before Vega sets so Vega is not visible when it sets. Have them record the time and location on their activity sheet. If their star is not visible when it sets because it is daytime, have them write not visible across the time and location for that date. Have students repeat steps four to seven for each date on their notebook sheet. Have them look at where their object rises on the eight days over two years. Ask if they see a pattern. Tell them to describe the pattern on their activity sheet.