

Science

Sun and Stars

5th Grade


DAY 1

<u>Pre-Lesson Preparation</u>	
Standard:	5-ESS1-1 Support an argument that the apparent brightness of the sun and stars is due to their relative distances from the Earth.
Objective:	By the end of the lesson, the student will be able to explain how distance affects the appeared brightness of stars with 80% accuracy.
Materials:	<ul style="list-style-type: none"> - Google Slide - 2 identical flashlights of the same size and brightness. - Crash Course Video (2:39-4:30) - Sun and Other Stars Video (1:43-4:01) - Poster board (enough for each student to have one). - Colored writing utensils(markers, colored pencils, etc.). - Students will need devices (laptop, tablet, etc.) with internet connections. - Stars activity
Accommodate: (Gear Up/Down)	<p>Up: to gear the star activity up for an advanced learner, the teacher can have them do the activity with more than 1 star. They can also compare the stars to other stars in the solar system, rather than to the sun.</p> <p>Down: to gear down the poster activity for struggling learners, they can do this activity with a partner. If they need physical help creating it, they can work one-on-one with either the teacher or a para and the adult will do the drawing/writing, but the student will tell them where to put what on the poster.</p>
<u>Lesson Components</u>	
Engage:	The teacher will ask the students to reflect on a time where they stargazed - what did they see? what did they observe? Invite them to share their thoughts. Then, using the google slides , the teacher will ask them to share their observations of the picture of stars in the night sky - why are some bigger than others? why are some brighter than others? etc. Then explain to them that distance is the main cause of the differences in the stars. The closer stars are to the Earth, the bigger and brighter it will appear. Inversely, the farther away a star is from the Earth, the smaller and dimmer it will appear.
Explore:	To demonstrate this concept, the teacher will have the class go out into the hallway and stand at one end. The teacher will then have 2 student volunteers come to the middle of the hallway and shine their flashlight at the rest of the class - make sure they are equally distanced from the class . The light represents the stars in the sky. Have the other students

	<p>observe any similarities and differences (size, brightness, etc.) and write them down on a piece of paper. Everyone should notice that both lights are the same size, brightness, etc.</p> <p>After the students have had a chance to observe this, have 2 other volunteers come up and shine their flashlights at the class again, but this time, have the students stand 2 different distances away from them - have one student stand in the middle of the hallway and have the other go to the other end of the hallway. Have the other students jot down their observations about this second example. Everyone should notice that the light shining from farther away is not only smaller, but dimmer as well. Ask the students to share their thoughts with the people around them. Then call on a few students to share their thoughts with the class. Allow for discussion and clarify any questions the students may have. Return to the classroom.</p>
Explain:	<p>The teacher will show these 2 videos about the sun, stars, and distance from Earth:</p> <p>Crash Course Video (2:39-4:30)</p> <p>Sun and Other Stars Video (1:43-4:01).</p> <p>After watching these 2 videos, the teacher will clarify any questions the students may have. Then use the 5th slide on the google slides to explain further.</p>
Elaborate: (with STEM or writing)	<p>The students will create a poster diagram. They will draw out a representation of how distance affects the appeared brightness of stars. Each poster must include Earth, the sun, and 3 other stars (use the last slide on the google slides to show the names of different stars). The students must also include 3 major key points/facts about how distance affects our view on stars. The students can design their posters however they'd like as long as the stars they chose are accurately depicted.</p>
Evaluate:	<p>Now, each student will have a chance to research their own star from the list of the main stars in our solar system. They will fill in the short stars activity sheet online. When they have finished, the teacher will give each student a chance to share their findings with the rest of the class.</p>

DAY 2

<u>Pre-Lesson Preparation</u>	
Standard:	5-ESS1-1 Support an argument that the apparent brightness of the sun and stars is due to their relative distances from the Earth.
Objective:	By the end of the lesson, the student will be able to explain what causes some stars to appear brighter than others with 80% accuracy.
Materials:	<ul style="list-style-type: none">- Google Slides- Stars video- Flashlight- Small lamp with on/off switch (and an available outlet)- Cardboard box- Construction paper (poke holes all around it)- Tape- Astronaut video- Claim, Evidence/Example, and Reasoning worksheet- Our Bright Sun activity packet (borrowed from Teacher Toy Shop)
Accommodate: (Gear Up/Down)	<p>Up: to gear up the Our Bright Sun activity for an advanced learner, the teacher can have them complete the short answer portion of the packet as well.</p> <p>Down: to gear down the CER assignment for struggling learners, they can do it with a partner, as this assignment is a bit challenging.</p>
<u>Lesson Components</u>	
Engage:	The teacher will begin by asking students about what kinds of stars they have seen while looking at the night sky. Allow for stories and discussion between classmates. The teacher will then show this video about different kinds of stars. Then share some fun facts about stars (found on Ducksters.com).
Explore:	<p>The teacher should have already made this model beforehand.</p> <p>Students will observe the model representing brightness of stars and the sun. Move the flashlight around behind the construction paper (to act as the twinkling lights) with the lamp off. Have the students observe. Then do this again but with the lamp on. Have the students observe. The point of this model is to show that even though the stars are very big and bright in the night sky, factors (such as the sun and the atmosphere) can affect the appeared brightness when we look at them from Earth.</p> <p>I have attached pictures and a video example of the model I created at home below.</p> <p>VIDEO DEMONSTRATION</p>

	
Explain:	<p>The teacher will show this video of astronaut, James Reilly, describing what stars are like when viewed from space (you may have to play it a couple of times for the students to realize what he said because it is a quick video). The teacher will then ask the students what different factors they think play into what affects the brightness of stars - atmosphere, clouds, distance, temperature, etc. After allowing for discussion, use the 3rd slide on the google slides to further explain the different factors that affect brightness.</p>
Elaborate: (with STEM or writing)	<p>The students will now research their own evidence for the claims given on the claim, evidence/example, and reasoning worksheet. They may use Google, YouTube or any other resource to help them find the information. Once finished, the students will be given a chance to share their findings with the class.</p>
Evaluate:	<p>The students will now complete the Our Bright Sun activity. They will do the short reading and fill in the blank story. Once finished, they will turn it in.</p> <p>OPTIONAL AFTER ACTIVITY: The packet also contains a silly version of the fill in the blank story. Students can work in small groups or partners to fill in their own answers and share their silly stories with the class.</p>