Materials: pre-cut star diameters (Sun, Alshain, Eta Herculis), measuring tape, masking tape

SC.3.E.5.3 Recognize that the Sun appears large and bright because it is the closest star to Earth.

Objective: To observe how the Sun appears larger than other stars because of its proximity to Earth.

Procedures:
1. Tape the Alshain and Eta Herculis pre-cut stars side-by-side on a wall at eye level (pictured below).

2. Using your measuring tape, measure one meter from the wall and mark it with a piece of masking tape. Label the tape “Starting Point” (pictured to the right).
3. Stand in front of the two stars and hold the pre-cut Sun at arm’s length. You will represent the Earth.
4. Close one eye and move directly backwards until the Sun appears to be the same size as Alshain. Measure the distance between the two stars using your tape measure and record in the chart below.
5. Close one eye and move directly backwards until the Sun appears to be the same size as Eta Herculis. Measure the distance between the two stars using your tape measure and record in the chart below.
6. Answer the following question in the space provided: What happens to the apparent size of the Sun as you move away from Alshain and Eta Herculis?

<table>
<thead>
<tr>
<th>The Deceiving Size of the Sun</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

7. Answer the following question in the space provided: What will happen to the apparent sizes of Alshain and Eta Herculis if you were to continue moving away from the Starting Point?
A 360-degree view of the Milky Way opens doors for scientific study

By Milwaukee Journal Sentinel, adapted by Newsela staff

MILWAUKEE — A team of Wisconsin scientists has come up with something very exciting: a 360-degree view of the Milky Way. The new view shows our galaxy from every direction.

Galaxies are large groups of stars held together by gravity. They don't only contain stars, though. There are also the planets, gasses and space dust found between the stars. Earth is located in the Milky Way, which is only one of many galaxies. All of the galaxies make up our universe.

The new picture of the Milky Way is known as GLIMPSE360. It was presented on Thursday.

GLIMPSE360 is made up of about 2.5 million pictures. These were taken by NASA's Spitzer Space Telescope. Spitzer has been mapping the galaxy for more than 10 years. It is actually in outer space, in orbit.

An Infrared View

Spitzer is an infrared telescope. That is, it shows things as they look in infrared light. This allows scientists to see much that isn't visible in ordinary light. Infrared telescopes can cut through clouds of space dust. Ordinary telescopes can't see through such dust.

Scientists have learned a great deal from Spitzer's pictures. They have been able to study much that was previously hidden in the Milky Way. More than 200 million new stars have been discovered.

Thanks to GLIMPSE360, scientists can now easily examine the overall shape of the Milky Way. It has parts that stick out, like arms. Scientists can now see how many "arms" it has. And they also can see just where those arms are, and how long they are.

Viewers can see more than the shape of the whole galaxy. They also can zoom in on particular objects.
Star Births And More

GLIMPSE360 has already shown how useful it can be. It has proven something scientists had suspected: A large bar runs straight through the center of the Milky Way. This is made up of millions of stars.

The bar stretches out for a huge distance: around 12,500 light years from the galaxy’s center. One light year alone equals around 6 trillion miles.

And GLIMPSE360 can help scientists in a lot of other ways as well.

“We can see stars being born,” scientist Edward Churchwell said. Now we can start to learn more about "how stars are formed. We don’t really understand the details of how stars are born."

Scientists may also be able to figure out where stars are formed.

“We can see every star-forming region,” said scientist Robert Benjamin.

The new view may show scientists something else as well: how quickly the Milky Way is growing. “It tells us how many stars are forming each year,” said scientist Barb Whitney.

The position of the stars in our galaxy is now visible. And scientists will be able to learn more about the dust that lies between the stars.

Gas Patch Mysteries

But GLIMPSE360 has found some new puzzles. For example, it shows that space is filled with patches of gas.

These gas patches are brightest around stars that are forming, Churchwell said. But they also can be seen all over the Milky Way. "They’re floating" out in space between stars "where they have no business being. It raises the question of how they were formed."

The Spitzer Telescope was sent into space in 2003. It was only expected to keep running for two and half years. More than 10 years later, it’s still sending back pictures.

Scientists have made a lot of use of the information from Spitzer. More than 600 scientific papers have been published.

Indeed, Spitzer has provided enough new information to keep scientists busy for many, many years. “It’s done what we wanted it to do,” Churchwell said.

https://newsela.com/articles/milkyway-discovery/id/3180/
Exit Ticket(s):

Which statement **best** explains why nighttime stars appear so much smaller and dimmer* than the Sun?

The sky is much darker at night so the stars look smaller.

The stars are much farther away from the Earth than the Sun.

The stars are much smaller than the Sun so they are also dimmer.

The Moon blocks out most starlight so the stars look smaller and dimmer.

A student sees the Moon and says, “The Moon looks larger than the stars.” Which of the following **best** explains why the student makes this observation?

The Moon is much larger than Earth.

The Moon is much larger than the stars.

The Moon is reflecting light from the Sun.

**The Moon is closer to Earth than the stars.**