Astronomy Blast- Part 1 Post Materials

Thank you for attending Astronomy Blast Part 1- Stars and Constellations. Attached are some activities that you can complete with students after your visit. Directions for these are below.

If you have any questions, please contact Planetarium Patty or Jessica Leedy using the email addresses below.

Stargazing RELA Activity

This activity is meant to mimic PARCC. Copy pages 2-3 front to back for students, or share with them electronically using the Google Form link here (full link below). Using the Google Form may be beneficial to mimic the PARCC computer responses. Students should read and annotate the text Stargazing (from ReadWorks), then use the text to answer the questions. An answer sheet is provided for teacher reference on page 3.
https://docs.google.com/forms/d/1v26U6r8DUyIcYifDh3GbTMsYnHuWIsWgLeC9HEJgWNk/copy
*Please note- When using the Google Forms version, there are currently no settings or questions to gather student information (emails or names). Please edit the form to include these if needed.

Star Distance and Brightness MISA Practice with Claim-Evidence-Reasoning (CER)

This activity is meant to mimic MISA. Copy pages 4-5 front to back for students. Students should read and analyze the text, graphs, and images about star distance and brightness. Then, students should shade in visible brightness graph to represent the data from the chart. Lastly, students should complete the claim-evidence-reasoning (CER) answering the question "How can the brightness of stars vary when we view them from Earth?". An answer sheet is provided for teacher reference on page 6.

Discovery Education Activity

Discovery Education has a Star Light, Looks Bright virtual lab that students can complete using a computer or other device. A suggestion would be to print the briefing document for students to follow, or to complete whole group.
https://app.discoveryeducation.com/learn/player/b40fdbfd-b276-4d81-99d7-7f03030ef605

Again, thank you for attending! If you have any questions or comments about the activities, please contact:

Howard B. Owens Science Center
9601 Greenbelt Road
Lanham, MD 20706

"Planetarium" Patty Seaton
patricia.seaton@pgcps.org
or
Jessica Leedy
jessica.leedy@pgcps.org

Name:_____

Read the text below and answer the questions.

Stargazing

From ReadWorks, 2013
The full article can be found here.

Try to think of the biggest star you've seen in the sky. An easy one, right? The sun! That's because the sun is closest to us compared to all other stars, located at just a short 150 million kilometers from Earth.

The next one? That's a tougher question. Many people answer Alpha Centauri, but some don't know that it's actually a cluster of three stars—Alpha Centauri A, Alpha Centauri B, and Proxima Centauri. Proxima Centauri is 4.24 light-years away and closest to our sun. A light-year is the distance that light travels in one year. We use this measurement because light is the only thing in the universe that maintains a constant speed. However, even though Proxima Centauri is the closest star to the earth after the sun, you can only see it with a very powerful telescope. That doesn't make sense—didn't we just say that closer stars appear larger and more visible?

Well, Proxima Centauri is what we call a red dwarf. Red dwarf stars are very small, typically having less than half the mass of the sun. That means they generate less energy than the sun. Most stars burn hydrogen for fuel. Similar to the way a car uses gas for power, a star uses hydrogen for energy. Red dwarfs burn hydrogen very slowly, which means they generate little light compared to stars like the sun.

Proxima Centauri is the closest star after the sun, but that doesn't necessarily mean it's what we consider close in our minds. To completely understand how far away this star is, let's think about traveling 4.24 light-years away. NASA has built one of the fastest spacecrafts in existence, called New Horizons, which travels at about 60,000 kilometers per hour. Even at this speed, it would take the spacecraft 78,000 years to reach Proxima Centauri from Earth.

Sadly, the first few closest stars are not visible to the naked eye at night, which means we can't see them while we're stargazing from our homes or backyards. The closest star we can see at night is called Sirius, or the Dog Star. While Proxima Centauri is only 4.24 light-years away, Sirius is 8.6 light-years away. However, since Sirius is so large (almost twice the size of the sun), we can see it in the night sky. So go outside and see what you can find up there!

1) Part A

Read the sentence from paragraph 2.

"Many people answer Alpha Centauri, but some don't know that it's actually a cluster of three stars…"

What does the word cluster as it is used in the sentence?

A. Grouped together
B. Expanding rapidly
C. Similar brightness
D. Very far away

Part B

What evidence from the text best supports your answer to Part A?

A. "A light-year is the distance that light travels in one year."
B. "...not visible to the naked eye at night…"
C. "...Alpha Centauri A, Alpha Centauri B, and Proxima Centauri…"
D. "...closest to our sun…"

2) Part A

What is the main idea of the passage from *Stargazing* above?

A. Star brightness varies by distance and size.
B. The sun is the only star we can see with our naked eye from Earth.
C. Stars can have various names based on brightness and size, like red dwarf.
D. Scientists use light-years to measure star distances.

Part B

Which TWO facts from the article would be the best details to support the main idea?

A. "...since Sirius is so large (almost twice the size of the sun), we can see it in the night sky."
B. "...the first few closest stars are not visible to the naked eye at night."
C. "...Proxima Centauri is what we call a red dwarf…"
D. "That's because the sun is closest to us compared to all other stars…"
E. "We use this measurement because light is the only thing in the universe that maintains a constant speed."

ANSWER KEY

1) Part A

Read the sentence from paragraph 2.

"Many people answer Alpha Centauri, but some don't know that it's actually a cluster of three stars…"

What does the word cluster as it is used in the sentence?

A. Grouped together
B. Expanding rapidly
C. Similar brightness
D. Very far away

Part B

What evidence from the text best supports your answer to Part A?

A. "A light-year is the distance that light travels in one year."
B. "...not visible to the naked eye at night..."
C. "...Alpha Centauri A, Alpha Centauri B, and Proxima Centauri..."
D. "...closest to our sun..."

2) Part A

What is the main idea of the passage from *Stargazing* above?

A. Star brightness varies by distance and size.
B. The sun is the only star we can see with our naked eye from Earth.
C. Stars can have various names based on brightness and size, like red dwarf.
D. Scientists use light-years to measure star distances.

Part B

Which TWO facts from the article would be the best details to support the main idea?

A. "...since Sirius is so large (almost twice the size of the sun), we can see it in the night sky."
B. "...the first few closest stars are not visible to the naked eye at night."
C. "...Proxima Centauri is what we call a red dwarf..."
D. "That's because the sun is closest to us compared to all other stars…"
E. "We use this measurement because light is the only thing in the universe that maintains a constant speed."

Name:_____

Directions: Read the passage and data, then answer the questions.

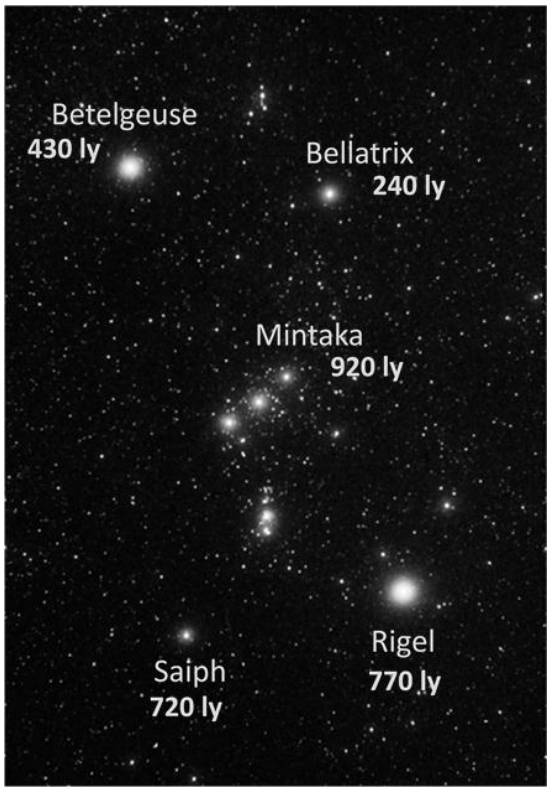
Star Distance and Visible Brightness

Below is information from the Hipparcos star data set, which gives scientist a variety of information about stars.

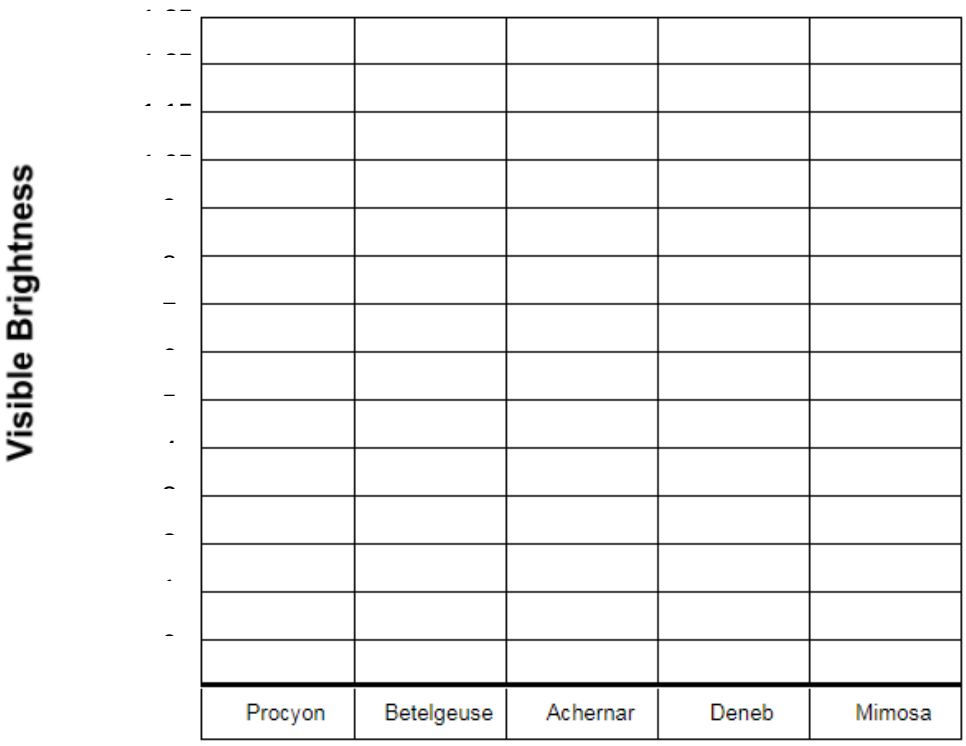
Star	Distance from Earth (light years)	Visible Brightness
Procyon	11.4	0.40
Betelgeuse	430	0.45
Achernar	144	0.45
Deneb	3200	1.25
Mimosa	350	1.25

Many students were using the data to make claims about the brightness of stars based on distances in Mrs. Santiago's fifth grade class.

One student created a visual model of various stars to show how this type of data tells us about stars. In her picture, ly stands for light-years.



One student wanted to represent that data above on a visual graph. Shade in the visible brightness for each star below.



Claim-Evidence-

Reasoning (C-E-R)

Student Graphic Organizer

☆Question:

How can the brightness of stars vary when we view them from Earth?

C **(Claim)** **Write a statement that responds to the question.**	
E **(Evidence)** **Provide scientific data to support your claim. Your evidence should be appropriate (relevant) and sufficient (enough to convince someone that your claim is correct). This can be bullet points instead of sentences.**	
R **(Reasoning)** **Use scientific principles and knowledge that you have about the topic to explain <u>why</u> your evidence (data) supports your claim.** **In other words, explain how your data proves your point?** **(paragraph format)**	

Claim-Evidence-Reasoning (C-E-R)

Student Graphic Organizer

ANSWER KEY

☆Question:

How can the brightness of stars vary when we view them from Earth?
Other ways of explaining for students- Why do we see stars different? How can the brightness change? What factors play a role in how we see stars?

C **(Claim)** **Write a statement that responds to the question.**	*Possible Claims:* *The brightness of stars varies by its distance from Earth.* *The brightness of stars varies by its size.* *The brightness of stars varies by its magnitude (inherent brightness).*
E **(Evidence)** **Provide scientific data to support your claim. Your evidence should be appropriate (relevant) and sufficient (enough to convince someone that your claim is correct). This can be bullet points instead of sentences.**	*Possible Evidence:* *Brighter stars are not necessarily the closest to the Earth in light-years.* *Betelguese and Achernar have the same visible brightness, but vary by distance.* *Deneb and Mimosa have the same visible brightness, but Deneb is much further away from Earth than Mimosa.*
R **(Reasoning)** **Use scientific principles and knowledge that you have about the topic to explain <u>why</u> your evidence (data) supports your claim.** **In other words, explain how your data proves your point?** **(paragraph format)**	*Student reasoning may vary based on selection of claim and evidence.* *Reasoning should provide the WHY of how their evidence matches the claim.* *Ex) Betelguese and Achernar have the same visible brightness, but vary by distance. This means that one must be intrinsically brighter.*