

HELLO, UNIVERSE

nonfiction readings
& activities

OVERVIEW OF CONTENTS

- Fun Anticipation Activity
- 9 Nonfiction Readings & Questions
- 3 Engaging Extension Activities
 - Advance in Astronomy Timeline
 - Constellation Project
 - Constellation Narrative Activity
- Digital Links for Google Drive™
- Answer Keys!

ASTRONOMY READINGS

HELLO, UNIVERSE

Name:

Nonfiction Reading: *The Night Sky: What's There to See?*



The U.S. at night – Densely populated areas, such as big cities, contribute to light pollution.

If you have ever looked up at the night sky and wondered about the cosmos, you are not alone! You are not the first, and surely, you will not be the last. The night sky has been a source of mystery for ages even as it has also provided information and help for tens of thousands of years. But what *exactly* are you looking at? The answer is out of this world!

To begin, let's start small – the eyeball. No two eyes are the same, and everyone sees differently. When it comes to our ability to see visible light in the night sky, the same concept applies. If you were to visit the darkest night sky, with no **light pollution**,¹ your ability to see stars with the naked eye would differ from others due to the fact everyone's individual eyes receive light differently.

Meanwhile, the night sky is filled with stars of varying brightness. The brighter the star, the lower its **magnitude**² is. The dimmer the star, the higher its magnitude is. The human eye cannot see above an apparent magnitude -6.5 at night. To put magnitude into perspective, the moon is an apparent magnitude -12 brightness, while the planet Venus is a -5.

Now, let's zoom out slightly and learn about another factor that influences how much of the night sky we can see with the naked eye – light pollution. Artificial light brightens the night sky and can be **disruptive**³ to the natural environment. Such **excessive**⁴ light is called light pollution. Most people live in areas affected by light pollution with suburban and urban areas being the most polluted. The light from a big city can reach over 100 miles away. As a result, our ability to see the stars is **hindered**.⁵ In short, what the naked human eye can see in the night sky is also affected by how much excessive light blocks the view from where they are standing.

There are additional factors that affect what a person can see in the night sky, but let's go beyond our planet to develop a broader sense of the universe and our naked eye's ability to see it. The universe is an **inconceivably**⁶ massive, ever-expanding space. Earth is located in the Milky Way galaxy, or a system of millions to billions of stars and gas held together by **gravity**.⁷ Within the Milky



9 Nonfiction Readings



Build Background Knowledge



Topics on Astronomy, Zodiac & Constellations



Common Core–Aligned Material

Way, Earth is located in a solar system held together by the gravitational attraction of the Sun and other planets. Needless to say, what we can *actually* see from Earth is just a tiny fraction of what's out there.

So, what *is* out there? Planets, satellite passes, comets, stars, galaxies, and more. Five planets, Mercury, Venus, Mars, Saturn, and Jupiter, can be seen in the night sky. With a small telescope, you can sometimes see planets as well as the moon. In addition, if you look closely enough at very small, fast moving objects in the sky, you may just be able to catch a glimpse of a satellite orbiting⁸ earth. On certain days or times of the year, comets may be in visible from Earth too as they continue on their orbit through our solar system. In addition to all these celestial⁹ objects, there are approximately 5,000 stars potentially visible at night. The closest star is Proxima Centauri, which is about 4.22 light-years from Earth, and one light-year is approximately 5.9 trillion miles. Finally, in the darkest of skies, you can see the Andromeda galaxy, which is 2.5 million light-years from Earth.

If you're wondering how to find or tell apart all these objects when you gaze upward, grab a map. Really! Guides are available to help you locate the objects described in the previous paragraph. A small pair of binoculars can also help. So, the next time you find yourself in the darkest of skies, pause and take it all in. As you look up, remember that there's much more to the night sky than meets the eye.



GLOSSARY OF TERMS

¹ Light pollution: inappropriate or excessive use of artificial light

² Magnitude: the degree of brightness of a star

³ Disruptive: causing disorder

⁴ Excessive: more than is necessary, normal, or desirable

⁵ Hindered: create difficulties for, resulting in delay or obstruction

⁶ Inconceivably: not capable of being imagined or grasped mentally; unbelievable

⁷ Gravity: the force that attracts a body toward the center of the earth, or toward any other physical body having mass

⁸ Orbiting: (of a celestial object or spacecraft) move in orbit around (a star or planet)

⁹ Celestial: positioned in or relating to the sky, or outer space as observed in astronomy

➤ Depth of Knowledge Questions

➤ Text Connections to Novel

➤ Use for Centers or Rotation Model

➤ Cross-Curricular Learning

RESOURCE ALSO INCLUDES...

Answer Keys ● Google Drive™ Links

EXTENSION ACTIVITIES

Constellation Coordinates



Map of constellation:

Location

When is it visible at night?

Hemisphere

Cardinal Direction

Neighboring Constellation



Steps to Locate Constellation in the Night Sky

- 1.
- 2.
- 3.
- 4.
- 5.

Size of Constellation

1. Size rank of constellation: _____
2. Size of constellation (in degrees): _____

➤ 3 Engaging Assignments

➤ Research Activities

➤ Narrative Writing

➤ Novel Connections



Celestial Body: _____



Image of Topic

Blank box for drawing an image of the celestial body.

Profile

Who discovered this celestial body or the first one?

When was this celestial body or the first one discovered?

How can this celestial body be seen in the night sky?

Research Facts

1. Describe the celestial body you studied. What is it? _____

2. What is the celestial body made of? How did it come to exist? _____

Fun Facts

What makes the celestial body you studied unique? Write down at least 3 interesting facts.

-
-
-



Use for
Centers or
Rotation Model



Common Core-
Aligned Material



Cross-
Curricular
Learning



Collaborative
Work

RESOURCE ALSO INCLUDES...

Answer Keys ● Google Drive™ Links

BUNDLE & SAVE!

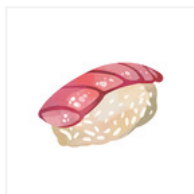
This resource is part of a comprehensive unit on *Hello, Universe!* Click the cover below to preview all the resources available.



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