**Lesson Plan**

**The Night Sky by Another Name**



*Star formation in the constellation Orion as photographed in infrared by NASA’s Spitzer Space Telescope. Image courtesy of Wikimedia Commons.*

**Grade Level(s): 4-5 Subject(s): History, Astronomy**

**In-Class Time: 40-45 min Prep Time: 10-15 min**

**Materials**

* Copies of the myths handouts, one story for each student (see the Supplemental Materials)
* Either one large copy/projection of the image of Orion (see the Supplemental Materials)

**Objective**

In this lesson, students will learn about the way different African cultures have understood what we know as the Orion constellation. This lesson helps students understand European and American worldviews of science and invites them to think about different ways to understand the Earth and the universe.

**Introduction**

When we learn about the stars, we usually learn the names of constellations such as Aries, Cancer, Gemini, Capricorn, Sagittarius, Leo, Libra, Pisces, Orion, and others. Many of these constellations are based on Greek mythology and are just one way that people have learned to organize the stars. Across the Earth, different peoples have looked into the stars and seen different patterns and different stories.

People throughout history and all over the world have devised their own way of understanding the world around them. Myths, or traditional stories that may involve magic or magical beings, often express these views. Members of different societies tell their own myths and ascribe aspects of these mythologies to the stars. The stars in the constellation that we recognize as Orion are no different.

Orion is one of the most recognizable constellations in the night sky. To the ancient Greeks, this constellation resembled the giant hunter who was placed, by the Greek god Zeus, among the stars. To the Egyptians, however, this constellation resembled the god Osiris, the Egyptian Lord of the Underworld. When a Pharaoh died, his soul was judged by the god Osiris. If he was judged to be good, his soul would rest peacefully among the stars in the west. However, if he was found to be bad, his soul would be sent north where he would be forced to eternally circle the North Star with other beasts. The three stars that make up Orion’s belt were seen as a stairway of the world’s structure by the Dogon people and as three zebras that had been hunted by a god to the Ju/Wasi of Southern Africa.

In this lesson, students will take part in a universal human experience, finding figures in the stars and assigning meaning to them. They will learn some of the figures that members of different African cultures have assigned to the stars and hear the stories associated with them. During this lesson, students should be prompted to consider that different groups of people have different ways of understanding the stars and the world around them, even the students themselves have a specific point of view that shapes how they understand the world. **Note:** This lesson pairs well with the AIP Teacher’s Guides on Women and Minorities in the Physical Sciences: “Follow the Drinking Gourd: Astronomy and the Underground Railroad”. Although this lesson plan is written for grades 6-8, it can easily be modified to suit grades 4-5. This recommended lesson examines the lyrics of an African American folksong that directed escaped slaves on how to use the stars to navigate their way north. It utilizes a website to help students understand how the night sky changes over time and how it looks different from different places on Earth.

**Instructions**

**Engage: 5 Minutes**

|  |  |
| --- | --- |
| To begin this activity, students will be asked to recall their previous knowledge about constellations. | |
| **What is the teacher doing?**  Ask your students what they know about constellations and to name any constellations they know of. By the end of this section your students should know that constellations are groups of stars forming a recognizable pattern that is traditionally named after its apparent form or identified with a mythological figure. | **What are the students doing?**  Remember what they know about constellations and recall the names of as many constellations as possible. |
| Either project or put up the image of Orion (see the Image of Space in the supplemental materials). Ask the students if they can see any figures in the stars. | Use their imagination to find figures in the stars. |

**Explore: 5-10 Minutes**

|  |  |
| --- | --- |
| People throughout history and all over the world have looked into the sky and tried to connect the stars into figures. In this portion of the lesson, the students will each learn about one figure that was identified by members of different African cultures and the mythology around that figure. | |
| **What is the teacher doing?**  Divide the class either into 4 groups or groups of 4.  If 4 groups:  Give each group a different mythological story (see the Myths handouts in the supplemental materials). Give the students a few minutes to read their story and then discuss it within the group.  If groups of 4:  Give each member of the group a different mythological story. Give the students a few minutes to read their stories to themselves. | **What are the students doing?**  If 4 groups:  Read their given myth silently to themselves. Talk within their groups about the story that they all just read.  If groups of 4:  Read their given myth silently to themselves. |

**Explain: 15 Minutes**

|  |  |
| --- | --- |
| The students will retell the stories that they read for the rest of the class. They will identify the constellation on the sky for the rest of the class. | |
| **What is the teacher doing?**  If 4 groups:  Go around the class and have a representative from each group retell the story in their own words to the rest of the class.  If groups of 4:  Have each student retell the story that they read to the other members of their group. | **What are the students doing?**  If 4 groups:  The representative from each group will retell their story in their own words to the rest of the class. When not presenting, the students will listen carefully to their classmates as they recount their tales.  If groups of 4:  Each student will recount their story for the rest of their group. When not presenting, the students will listen carefully to their classmates as they tell their tales. |

**Elaborate: 10 Minutes**

|  |  |
| --- | --- |
| Students are often taught about history and science from a Eurocentric point of view. It is important to discuss global points of view and understand the commonalities between people across the globe. By discussing the different views and interpretations of the skies students can see that there are different ways of looking at things and that people all over the world have wondered about the cosmos throughout history. | |
| **What is the teacher doing?**  Lead a discussion about the broader impacts of what they’ve done in this lesson. See possible discussion questions and answers below. | **What are the students doing?**  Make connections about the different stories they learned in this lesson and the different peoples they heard about. |

**Evaluate: 5 Minutes**

|  |
| --- |
| The students can be evaluated on their retelling of the story that they read as well as their participation in the discussion. |

**Required/Recommended Reading and Resources**

Required Reading:

* Myths handout (see Supplemental Materials)

Recommended Resources:

* STARLAB produces portable planetariums on different themes, one of which is African Mythology. They have developed a curriculum on African mythology and the stars are available at <http://starlab.com/wp-content/uploads/2012/02/D.7.AfricanMythology.pdf>.
* Dr. Jarita Holbrook is an African American filmmaker, astrophysicist, and author who has written extensively on African astronomy. She has produced films on African Americans in physics. For more information, visit her website at <http://jaritaholbrook.com/>.
* Brown, Dayle L. *Skylore from Planet Earth: Stories from Around the World-- Orion*. Bloomington, Ind: AuthorHouse, 2004. This book contains stories about the Orion constellation from around the world.

**Discussion Questions**

1. **Today we learned that different cultures have different ways of identifying and understanding the stars. Do you think that our culture has an effect on how you understand the world around you? Explain.**

Possible answers: Yes, culture does affect how we understand the world. People’s religious beliefs or their faith in science will dictate how they think the world was created. People have different ideas about how to cure illnesses, modern vs traditional medicine.

1. **What else do you think different cultures understand differently?**

Possible answers: If different cultures understand the stars differently, then other cultures might have different ways of understand how our bodies work, how the universe was made, where we come from, how plants grow, etc.

Related AIP Teacher’s Guides on Women and Minorities in the Physical Sciences:

**Further Reading and Additional Resources**

* “Follow the Drinking Gourd: Astronomy and the Underground Railroad”

**Extensions**

To further explore other culture’s constellations or the cultures of the peoples mentioned in this lesson plan, please consult the following resources:

* Womack, M. (2005). *Symbols and meaning: A concise introduction*. Walnut Creek, CA: Altamira Press. This book is about the presence of symbols in human life. It provides more information about the Dogon people and their culture.
* Heifetz, M. D., & Tirion, W. (2012). *A walk through the southern sky: A guide to stars, constellations and their legends*. Cambridge: Cambridge University Press. This book is about the stars and constellations of the southern hemisphere. It retells the myths and legends associated with many of the southern sky constellations.
* Related AIP Teacher’s Guides on Women and Minorities in the Physical Sciences:
  + Night Sky by Another Name Lesson Plan for Grades 6-8

**Common Core Standards**

For more information on Common Core Standards, visit <http://www.corestandards.org/>.

|  |  |
| --- | --- |
| Reading: Literature | |
| CCSS.ELA-LITERACY.RL.4.2 | Determine a theme of a story, drama, or poem from details in the text; summarize the text. |
| CCSS.ELA-LITERACY.RL.4.7 | Make connections between the text of a story or drama and a visual or oral presentation of the text, identifying where each version reflects specific descriptions and directions in the text. |
| CCSS.ELA-LITERACY.RL.4.9 | Compare and contrast the treatment of similar themes and topics (e.g., opposition of good and evil) and patterns of events (e.g., the quest) in stories, myths, and traditional literature from different cultures. |
| CCSS.ELA-LITERACY.RL.5.2 | Determine a theme of a story, drama, or poem from details in the text, including how characters in a story or drama respond to challenges or how the speaker in a poem reflects upon a topic; summarize the text. |
| CCSS.ELA-LITERACY.RL.5.7 | Analyze how visual and multimedia elements contribute to the meaning, tone, or beauty of a text (e.g., graphic novel, multimedia presentation of fiction, folktale, myth, poem). |
| CCSS.ELA-LITERACY.RL.5.9 | Compare and contrast stories in the same genre (e.g., mysteries and adventure stories) on their approaches to similar themes and topics. |
| Speaking & Listening | |
| [CCSS.ELA-LITERACY.SL.4.1](http://www.corestandards.org/ELA-Literacy/SL/4/1/) | Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly. |
| [CCSS.ELA-LITERACY.SL.4.4](http://www.corestandards.org/ELA-Literacy/SL/4/4/) | Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace. |
| [CCSS.ELA-LITERACY.SL.5.1](http://www.corestandards.org/ELA-Literacy/SL/5/1/) | Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly. |
| [CCSS.ELA-LITERACY.SL.5.4](http://www.corestandards.org/ELA-Literacy/SL/5/4/) | Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace. |

**Next Generation Science Standards**

For more information on the Next Generation Science Standards, visit <http://www.nextgenerationscience.org/>.

|  |  |
| --- | --- |
| [Dimension One: Practices](http://www.nextgenscience.org/sites/ngss/files/Appendix%20F%20%20Science%20and%20Engineering%20Practices%20in%20the%20NGSS%20-%20FINAL%20060513.pdf) | 1. Asking questions (for science) and defining problems (for engineering) |
| [Dimension Two: Crosscutting Concepts](http://www.nextgenscience.org/sites/ngss/files/Appendix%20G%20-%20Crosscutting%20Concepts%20FINAL%20edited%204.10.13.pdf) | 1. Patterns 2. Scale, proportion, and quantity 3. Systems and system models |
| [Dimension Three: Disciplinary Core Ideas](http://www.nextgenscience.org/sites/ngss/files/Appendix%20E%20-%20Progressions%20within%20NGSS%20-%20052213.pdf) | Core Idea ESS1: Earth’s Place in the Universe  Core Idea ETS2: Links Among Engineering, Technology, Science, and Society |