

Lesson 3 Part 1: Introduction

Citing Evidence to Make Inferences

LAFS

8.RI.1.1: Cite the textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text.

Theme: *Light Phenomena*

People who believe there's life on other planets use evidence, such as UFO sightings, to back up their claims. **Evidence** is information used to support an opinion or belief. Evidence can also be used to support an **inference**, or reasonable guess, that's based on new facts combined with what you already know.

Look at the picture below, which many people thought showed an alien spacecraft. What evidence in the image and the caption supports or disproves that idea?



While returning from the Moon to Earth on April 27, 1972, Apollo 16 astronauts captured an unidentified flying object (UFO) on film. The image, described as "a saucer-shaped object with a dome on top," was visible in the film for about 4 seconds. It has since been identified.

Complete the chart with evidence that helps you figure out whether or not the object was an alien spacecraft. Consider details in both the image and the caption.

Text/Photo Evidence	+	Background Knowledge	=	Inference
<ul style="list-style-type: none"> The photo was taken in 1972. The object looks "saucer-shaped." Something else can be seen to the left of the "saucer." 		<ul style="list-style-type: none"> People often misunderstand what they see in photos. No one has yet confirmed that alien life exists. 		<p>This "saucer-shaped object" is probably NOT an alien spacecraft. There is probably another explanation.</p>

Good readers combine evidence and their own knowledge to support inferences. Although this UFO was spotted in 1972, no proof of alien life has ever been discovered. Plus, the image to the left of the "saucer" has to be explained, too. As it turns out, NASA scientists have shown that the "UFO" was actually the floodlight and boom from the Apollo 16 spacecraft itself!



Read the first three paragraphs of a scientific account about auroras.

Genre: Scientific Account

What Are Auroras? *by Georgiana Tomes*

Imagine a brilliant laser light show in the sky where ribbons of green, red, or violet dance across the atmosphere. While these fascinating lights might look like they come from machines, they are actually a natural phenomenon known as an aurora.

Auroras occur when highly charged electrons from solar wind interact with elements such as oxygen and nitrogen in the atmosphere. When the electrons strike the oxygen and nitrogen atoms, rays of light are formed. The color of these rays depends on which atoms collide and the altitude, or height, at which they meet. The rays often run parallel and take turns dimming and brightening in the night sky.

But where exactly do these light spectacles form? Like the needles of a compass, auroras are attracted to Earth's two magnetic ends: the geographic North and South Poles. The rays themselves follow the slanting direction of Earth's magnetic field.

(continued)

Explore how to answer this question: "What inference can you make about why auroras fascinate people?"

Think about the evidence the author provides about what auroras look like and where they appear.

Fill in the chart below with text evidence that helps you determine how auroras are similar to laser lights. Combine this text evidence with the provided background knowledge to form an inference.

Text Evidence	+	Background Knowledge	=	Inference
<ul style="list-style-type: none"> • Auroras look like green, red, or violet ribbons of light. • Auroras only appear near the North and South Poles. • • 	<ul style="list-style-type: none"> • People are always amazed by unusual natural events • 			

With a partner, discuss which piece of text evidence most strongly supports your inference and why. How does this evidence help you understand the appeal of the auroras?



Close Reading

Where are auroras visible? **Underline** two sentences that provide textual evidence explaining where people can view auroras.

Hint

Think about which choice provides you with the coordinates where auroras are visible.

Continue reading about auroras. Use the Close Reading and the Hint to help you answer the question.

(continued from page 20)

Auroras occur along “auroral ovals,” which surround the magnetic poles. These ovals roughly correspond with the Arctic and Antarctic circles. Aurora borealis (the Northern Lights) are visible near Earth’s magnetic north pole from high northern latitudes in North America, Europe, and Asia. Aurora australis (the Southern Lights) are visible near Earth’s magnetic south pole, from high southern latitudes in Antarctica, South America, New Zealand, and Australia.

Auroras also occur on other planets with magnetic poles, including Saturn and Jupiter.

Circle the correct answer.

A student makes the following inference based on reading the text.

Auroras are not visible from the low latitudes around the equator.

Which choice is the strongest piece of evidence in support of this claim?

- A** Auroras are seen from high latitudes near each magnetic pole.
- B** The Aurora borealis is visible in North America and Europe.
- C** The Aurora australis is visible in Antarctica and New Zealand.
- D** Auroras form near the magnetic poles of other planets as well.



Show Your Thinking

Explain why the answer you chose is the strongest support for the claim about auroras’ visibility.



With a partner, look for additional evidence on the previous page that would support the above inference. Discuss its strength.



Read the newspaper article. Use the Study Buddy and the Close Reading to guide your reading.

Genre: Newspaper Article



As I read the first paragraph, I learn that the airline employees are upset because no one believes them. As I keep reading, I'll look for more information about what is causing their unhappiness.

Close Reading

Does the FAA think the UFO sighting is real? **Circle** evidence that supports your inference.

What evidence can you find that shows the employees were not making up their story? **Underline** these details and **put a star (*)** next to the strongest piece of evidence.

from “In the sky! A bird? A plane? A . . . UFO?” by Jon Hilkevitch, Chicago Tribune

January 1, 2007

- 1 It sounds like a tired joke—but a group of airline employees insist they are in earnest, and they are upset that neither their bosses nor the government will take them seriously.
- 2 A flying saucerlike object hovered low over O’Hare International Airport for several minutes before bolting through thick clouds with such intense energy that it left an eerie hole in overcast skies, said some [airline] employees who observed the phenomenon.
- 3 Was it an alien spaceship? A weather balloon lost in the airspace over the world’s second-busiest airport? A top-secret military craft? Or simply a reflection from lights that played a trick on the eyes?
- 4 Officials at [the airline] professed no knowledge of the Nov. 7 event—which was reported to the airline by as many as a dozen of its own workers—when the *Tribune* started asking questions recently. But the Federal Aviation Administration said its air traffic control tower at O’Hare did receive a call from [an airline] supervisor asking if controllers had spotted a mysterious elliptical-shaped craft sitting motionless over Concourse C of the [airline] terminal.
- 5 No controllers saw the object, and a preliminary check of radar found nothing out of the ordinary, FAA spokeswoman Elizabeth Isham Cory said.
- 6 The FAA is not conducting a further investigation, Cory said. [...]
- 7 “Our theory on this is that it was a weather phenomenon,” she said. “That night was a perfect atmospheric condition in terms of low [cloud] ceiling and a lot of airport lights. When the lights shine up into the clouds, sometimes you can see funny things. That’s our take on it.”



Hints

Based on what you know about what the witnesses think they saw, which fact from the text explains their frustration?

What position does the FAA take regarding the UFO and why?

What led witnesses to say they saw a UFO? What support is there for this claim?

Use the Hints on this page to help you answer the questions.

- 1 Which of the following best explains why the witnesses are upset?
 - A The UFO left “an eerie hole in the overcast skies” after flying through the clouds over O’Hare.
 - B No air traffic controllers saw the UFO and there is no record of anything out of the ordinary on radar.
 - C The airline denied having knowledge of the UFO and the FAA will not investigate the incident further.
 - D The FAA admits that its air traffic control tower received a call about “a mysterious elliptical-shaped craft.”

- 2 Based on the article, which statement most strongly supports the FAA’s position on the UFO sighting?
 - A A preliminary radar check found nothing out of the ordinary at the time of the alleged UFO appearance.
 - B Although at least twelve airline employees saw the object, no air traffic controllers did.
 - C Many people saw an elliptical-shaped craft hover over Concourse C and leave a hole in the clouds.
 - D When lights shine up into the clouds during certain weather conditions, optical illusions can occur.

- 3 What evidence supports the claim that a flying saucer flew over O’Hare International Airport? Evaluate which piece of evidence is strongest.



Read the article. Then answer the questions that follow.

The Mysterious Marfa Lights

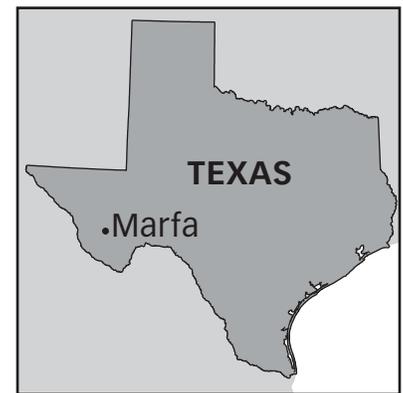
by Rachel Bernstein

1 Near the little town of Marfa in western Texas is one of the most incredible sights in the United States: the Marfa lights.

What Are the Marfa Lights?

2 The Marfa lights are spheres of light the size of soccer balls in bright colors of red, orange, green, blue, white, or yellow. They appear only 10 to 20 times each year, in all seasons and any kind of weather. Sightings occur between dusk and dawn, lasting from a few seconds to several hours. The Marfa lights seem to occur more frequently during the second half of the lunar cycle, between the full moon and the next new moon.

3 The balls of light may remain motionless as they pulse on and off with intensity varying from faint to almost blinding radiance. Then again, they can zigzag far up in the air and dart across the desert against prevailing winds. The ghostly lights can move singly, in pairs, or in groups; they can split apart and merge, or sometimes vanish and then reappear. Their movements are unpredictable, and nobody has quite determined what they are or where they come from.



Who Has Seen Them?

4 Robert Ellison reported seeing the Marfa lights in 1883 while driving cattle through Paisano Pass. In 1885, Texas settlers Joe and Sally Humphreys encountered the lights. More recently, Kyle Miller, a local business owner, reported his encounter with the lights:

Late one night, I was driving home from a business meeting. Route 90 was deserted, except for a few armadillos crossing the road. I was listening to an awesome country song when a single green ball flashed in the distance. Unfortunately, it lasted only a few seconds, but I remember thinking I'd seen a glowing basketball frozen in midair. It was so shocking that I nearly jumped out of my seat, and the hair stood on the back of my neck. I've heard about the ghost lights my whole life, but I had never seen them before.

These are just a few eyewitness reports. There are probably many people who have seen the lights but said nothing for fear of having their sanity doubted.

What Causes Them?

5 There are many theories about what causes the Marfa lights. In the past, superstitious locals thought they were the spirit of an Apache warrior. In 1883, a railroad engineer suggested they were kerosene lanterns at a nearby ranch. More recent proposals abound. Some investigators believe swamp gases cause them, while others believe they result from moonlight reflecting off the nearby Chinati Mountains. Still another hypothesis is that quartz crystals discharge static electricity when they warm in the daytime and cool at night.



6 Several studies have attempted to find the source of the Marfa lights. During World War II, pilots at Midland Army Air Field searched for a source from the air. In 1975, local pilot Fritz Kahl led one hundred observers on the “Marfa Ghost Light Hunt.” Neither investigation proved successful.

7 In May 2004, a group of university physics students conducted a new study using high-tech equipment. After four days, the students concluded that automobile headlights from a nearby highway caused the Marfa lights. They attributed the strange appearance and movement of these lights to what is called the Fata Morgana mirage.

8 The Fata Morgana mirage is a superior mirage, which is characterized by multiple distortions. With superior mirages, what you perceive to be higher in the sky is really lower to the ground. Light bends downwards when it hits a layer of cold air, making it appear as if what is below your sight line is actually straight ahead or above because you are seeing the inverted image of what is on the horizon projected above it. A Fata Morgana mirage can make distant objects appear to hover in the air.

9 Does this mean that the mystery of the Marfa lights has been solved? The answer is not quite that simple. In his 2010 book *Hunting Marfa Lights*, engineer James Bunnell describes sightings of the lights he and others have witnessed that couldn’t possibly have been caused by a superior mirage.

How Can You See Them?

10 With so many conflicting theories about the lights, people complain that there will never be a definitive answer about their origin. However, the local population has few complaints about the mysterious lights. The highway department has constructed an official viewing site near Marfa. And every Labor Day weekend, there is a Marfa Lights Festival held in celebration of the lights that includes a parade and other events. Marfa’s economy booms as hotels fill up quickly and tourists spend their money on food, entertainment, and souvenirs.

11 If you want to attempt to see the Marfa lights, spend time between Marfa and Paisano Pass, south of Route 90. The most advantageous viewing spot is near U.S. Highway 67 on Mitchell Flat.

Answer Form

1 (A) (B) (C) (D)

2 (A) (B) (C) (D)

3 (A) (B) (C) (D)

Number Correct

3

1 Which sentence from the article **best** explains why the Marfa lights remain a mystery?

- A** “They appear only 10 to 20 times each year, in all seasons and any kind of weather.”
- B** “Sightings occur between dusk and dawn, lasting from a few seconds to several hours.”
- C** “The Marfa lights seem to occur more frequently during the second half of the lunar cycle, between the full moon and the next new moon.”
- D** “With so many conflicting theories about the lights, people complain that there will never be a definitive answer about their origin.”



2 Read these sentences from paragraph 4 of the article.

These are just a few eyewitness reports. There are probably many people who have seen the lights but said nothing for fear of having their sanity doubted.

Which statement explains why there are few eyewitness reports?

- A Those who saw the lights and reported them were ignored.
- B Kyle Miller was ill when he reported that he saw the lights.
- C People who report strange phenomena are usually not believed.
- D The Humphreys probably saw the lights again but said nothing.

3 Which detail from the article illustrates that not all of the Marfa lights are caused by headlights from a nearby highway?

- A The balls of light remain motionless and pulse on and off, switching from faint to bright.
- B Robert Ellison saw the Marfa lights in 1883 while driving cattle, before cars were invented.
- C The lights are the size of soccer balls in bright colors of red, orange, green, blue, white, or yellow.
- D There are too many conflicting theories, so there will never be a definitive answer about their origin.

4 Paragraph 10 states, “the local population has few complaints about the mysterious lights.” Explain why you think this is true. Use **one** quote from the article to support your explanation.

 **Self Check** Go back and see what you can check off on the Self Check on page 1.