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# Risk and Exploration

“ All adventures, especially into new territory, are scary. ”

—Sally Ride

# Risk and Exploration



In this collection, you will encounter individuals who must confront a compelling question: How far is too far?



COLLECTION

## PERFORMANCE TASK Preview

After reading the selections in this collection, you will consider the risks of exploration in extreme conditions and present an argument on whether it is worth the costs.

## ACADEMIC VOCABULARY

Study the words and their definitions in the chart below. You will use these words as you discuss and write about the texts in this collection.

Word	Definition	Related Forms
<b>complex</b> (kŏm'plĕks') <i>adj.</i>	consisting of many interwoven parts that make something difficult to understand	complex number, complexity, complicate, complicated
<b>potential</b> (pə-tĕn'shəl) <i>adj.</i>	capable of doing or being something; having possibility	potent, potentiality, potential energy
<b>rely</b> (rĭ-lĭ') <i>v.</i>	to depend on something or someone for support, help, or supply	reliable, reliability, reliance, reliant
<b>stress</b> (strĕs) <i>v.</i>	to put emphasis on something	stress fracture, stressed, stressed-out, unstressed, stressful
<b>valid</b> (vāl'ĭd) <i>adj.</i>	convincing or having a sound reason for something	invalid, invalidation, validate, validation



**Background** In 1957, the country then known as the Soviet Union launched the first satellite to orbit Earth. The Soviet Union and the United States were bitter enemies at the time. After becoming the 35th president of the United States in 1961, **John F. Kennedy** was determined to equal the Soviet's knowledge of space. Well known for many accomplishments as president, Kennedy is also remembered as an inspirational speaker. He gave this speech the day before his assassination in November 1963.



# Remarks at the Dedication of the Aerospace Medical Health Center

Speech by John F. Kennedy

**SETTING A PURPOSE** As you read, pay attention to the points President Kennedy is making. Why does he think the United States should be involved with space research?



As you read, mark up the text. Save your work to **myNotebook**.

- Highlight details
- Add notes and questions
- Add new words to **myWordList**

**M**r. Secretary, Governor, Mr. Vice President, Senator, Members of the Congress, members of the military, ladies and gentlemen:

For more than 3 years I have spoken about the New Frontier.<sup>1</sup> This is not a partisan term, and it is not the exclusive property of Republicans or Democrats. It refers, instead, to this Nation's place in history, to the fact that we do stand on the edge of a great new era, filled with both crisis and opportunity, an era to be characterized by achievement and by challenge. It is an era which calls for action and for the best efforts of all those who would test the unknown and the

<sup>1</sup> **New Frontier:** term Kennedy used in his presidential campaign.

uncertain in every phase of human endeavor. It is a time for pathfinders and pioneers.

I have come to Texas today to salute an outstanding group of pioneers, the men who man the Brooks Air Force Base School of Aerospace Medicine and the Aerospace Medical Center. It is fitting that San Antonio should be the site of this center and this school as we gather to dedicate this complex of buildings. For this city has long been the home of the pioneers  
20 in the air. It was here that Sidney Brooks, whose memory we honor today, was born and raised. It was here that Charles Lindbergh and Claire Chennault,<sup>2</sup> and a host of others, who, in World War I and World War II and Korea, and even today have helped demonstrate American mastery of the skies, trained at Kelly Field and Randolph Field,<sup>3</sup> which form a major part of aviation history. And in the new frontier of outer space, while headlines may be made by others in other places, history is being made every day by the men and women of the Aerospace Medical Center, without whom there  
30 could be no history.

Many Americans make the mistake of assuming that space research has no values here on earth. Nothing could be further from the truth. Just as the wartime development of radar gave us the transistor, and all that it made possible, so research in space medicine holds the promise of substantial benefit for those of us who are earthbound. For our effort in space is not, as some have suggested, a competitor for the natural resources that we need to develop the earth. It is a working partner and a coproducer of these resources. And  
40 nothing makes this clearer than the fact that medicine in space is going to make our lives healthier and happier here on earth.

I give you three examples: first, medical space research may open up new understanding of man's relation to his environment. Examinations of the astronaut's physical, and mental, and emotional reactions can teach us more about the differences between normal and abnormal, about the causes and effects of disorientation, about changes in **metabolism**

**metabolism**

(mī-tāb'ə-liz'əm) *n.*  
The *metabolism* of a living thing is all the processes that allow for growth and life.

<sup>2</sup> **Sidney Brooks . . . Charles Lindbergh . . . Claire Chennault** (shən'ôlt): Sidney Brooks was a young flyer killed in a training accident. Charles Lindbergh was the first transatlantic solo pilot, and Claire Chennault was an important figure in the development of air-war theories.

<sup>3</sup> **Kelly Field and Randolph Field:** airfields in the San Antonio area where many military pilots were trained.

which could result in extending the life span. When you  
50 study the effects on our astronauts of exhaust gases which can  
contaminate their environment, and you seek ways to alter  
these gases so as to reduce their toxicity, you are working on  
problems similar to those we face in our great urban centers  
which themselves are being corrupted by gases and which  
must be clear.

And second, medical space research may revolutionize  
the technology and the techniques of modern medicine.  
Whatever new devices are created, for example, to monitor  
our astronauts, to measure their heart activity, their breathing,  
60 their brain waves, their eye motion, at great distances and  
under difficult conditions, will also represent a major advance  
in general medical instrumentation. Heart patients may even  
be able to wear a light monitor which will sound a warning if  
their activity exceeds certain limits. An instrument recently  
developed to record automatically the impact of acceleration  
upon an astronaut's eyes will also be of help to small children  
who are suffering miserably from eye defects, but are unable to  
describe their **impairment**. And also by the use of instruments  
similar to those used in Project Mercury, this Nation's private  
70 as well as public nursing services are being improved, enabling  
one nurse now to give more critically ill patients greater  
attention than they ever could in the past.

**impairment**

(im-pâr'mənt) *n.*  
An *impairment* is an  
injury or weakness.

And third, medical space research may lead to new  
safeguards against hazards common to many environments.  
Specifically, our astronauts will need fundamentally new  
devices to protect them from the ill effects of radiation which  
can have a profound influence upon medicine and man's  
relations to our present environment.

Here at this center we have the laboratories, the talent,  
80 the resources to give new **impetus** to vital research in the life  
centers. I am not suggesting that the entire space program  
is justified alone by what is done in medicine. The space  
program stands on its own as a contribution to national  
strength. And last Saturday at Cape Canaveral I saw our new  
Saturn C-1 rocket booster,<sup>4</sup> which, with its payload,<sup>5</sup> when it  
rises in December of this year, will be, for the first time, the  
largest booster in the world, carrying into space the largest  
payload that any country in the world has ever sent into space.

**impetus**

(im'pī-təs) *n.* The  
*impetus* is the driving  
force or motivation  
behind an action.

<sup>4</sup> **booster:** a rocket used to launch a spacecraft.

<sup>5</sup> **payload:** the load carried by a rocket or other vehicle.

I think the United States should be a leader. A country as  
90 rich and powerful as this which bears so many burdens and  
responsibilities, which has so many opportunities, should be  
second to none. And in December, while I do not regard our  
mastery of space as anywhere near complete, while I recognize  
that there are still areas where we are behind—at least in one  
area, the size of the booster—this year I hope the United States  
will be ahead. And I am for it. We have a long way to go. Many  
weeks and months and years of long, **tedious** work lie ahead.  
There will be setbacks and frustrations and disappointments.  
There will be, as there always are, pressures in this country  
100 to do less in this area as in so many others, and temptations  
to do something else that is perhaps easier. But this research  
here must go on. This space effort must go on. The conquest  
of space must and will go ahead. That much we know. That  
much we can say with confidence and conviction.

Frank O'Connor, the Irish writer, tells in one of his books  
how, as a boy, he and his friends would make their way across  
the countryside, and when they came to an orchard wall that  
seemed too high and too doubtful to try and too difficult to  
110 permit their voyage to continue, they took off their hats and  
tossed them over the wall—and then they had no choice but  
to follow them.

This Nation has tossed its cap over the wall of space, and  
we have no choice but to follow it. Whatever the difficulties,  
they will be overcome. Whatever the hazards, they must be  
guarded against. With the vital help of this Aerospace Medical  
Center, with the help of all those who labor in the space  
endeavor, with the help and support of all Americans, we will  
climb this wall with safety and with speed—and we shall then  
explore the wonders on the other side.

120 Thank you.

**COLLABORATIVE DISCUSSION** Kennedy makes several points  
about why he thinks the United States should be involved with  
space research. Do you think the points he makes are valid? Does  
his speech inspire you to support space research? Discuss your  
ideas with a partner.

**tedious**

(tēˈdē-əs) *adj.*  
Something that is  
*tedious* is boring.

## Trace and Evaluate an Argument

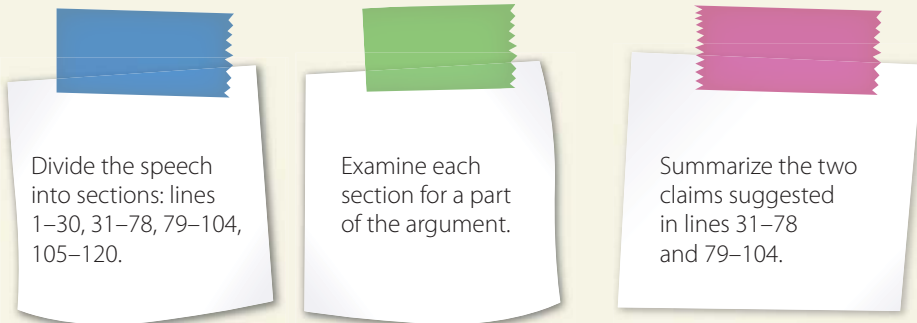
ELA RI.7.5, RI.7.8  
ELD PI.7.7, PII.7.1

The speech you've just read is an **argument**, in which the speaker states a claim supported by reasons and evidence. A **claim** is the speaker's position on a problem or an issue. The strength of an argument relies not on the claim but on the support. **Support** consists of reasons and evidence used to prove the claim. **Reasons** are declarations made to explain an action or belief. **Evidence** includes specific facts, statistics, or examples.

To **trace**, or follow the reasoning of, an argument:

- Identify the claim, which may be stated directly or implied.
- Look for reasons and evidence that support the claim.
- Pay attention to the way the author connects the claim, reasons, and evidence.
- Identify **counterarguments**, which are statements that address opposing viewpoints. A good argument anticipates opposing viewpoints and provides counterarguments to disprove the opposing views.

Some arguments have more than one claim, which might only be determined after careful examination of the text. To trace the argument in Kennedy's speech:



To **evaluate** an argument, or decide whether it makes sense and is convincing:

- Consider whether the evidence logically supports the claim.
- Examine the logic to ensure the ideas make sense and are in a proper order.
- Consider whether the opposing view has been adequately addressed.
- Identify persuasive techniques such as appeals to emotion.



## Analyzing the Text

### Cite Text Evidence

Support your responses with evidence from the text.

- 1. Interpret** Kennedy refers to his audience as *pathfinders* and *pioneers* and mentions the *New Frontier*. Why might Kennedy use these words?
- 2. Cite Evidence** Using a chart like the one shown, identify two opposing viewpoints that Kennedy anticipates in lines 31–42 and cite Kennedy’s counterarguments to those viewpoints.

Opposing Viewpoints	Kennedy’s Counterarguments

- 3. Draw Conclusions** Reread lines 64–68. How does Kennedy describe the children who might benefit from medical space technology? What might Kennedy be trying to accomplish through his choice of language?
- 4. Draw Conclusions** Examine lines 79–88. Describe Kennedy’s shift in focus. Why might Kennedy make this shift in his argument?
- 5. Cite Evidence** Examine lines 112–119. Identify phrases that Kennedy repeats. What ideas is he emphasizing with this repetition?
- 6. Evaluate** Considering the audience and purpose of Kennedy’s speech, is his argument convincing? Do his conclusions arise logically from the reasons and evidence he has cited?

## Speaking and Listening

Listen to an audio version of President Kennedy delivering the speech you have just read. How is hearing the speech different from reading it? With a partner or small group, choose two sections of the speech and discuss how the delivery of the speech conveys the meaning of the words.

### PERFORMANCE TASK



#### Writing Activity: Research Report

Research a recent or planned space mission for medical research by NASA (National Aeronautics and Space Administration).

- Identify one mission and write a brief description of its purpose and outcome.
- Explain whether or not it is in keeping with Kennedy’s views about space research.
- Share your findings with the class.



## Critical Vocabulary

ELA L.7.4a, L.7.4c, L.7.4d

ELD PI.7.6

**metabolism**

**impairment**

**impetus**

**tedious**

**Practice and Apply** Choose the response that best answers each question. Then discuss with a partner why the other choices are incorrect.

- If a person's **metabolism** were not functioning properly, what symptom might be present?
  - toned muscles
  - labored breathing
  - tanned skin
  - shiny hair
- Which condition would be considered an **impairment**?
  - sensitive taste buds
  - a slight limp
  - 20/20 vision
  - a photographic memory
- Which would NOT serve as an **impetus** to study harder?
  - a chance to play on a team
  - a mention on the honor roll
  - a reward from a parent
  - a speech on physical fitness
- Which task might be the most **tedious**?
  - walking your dog
  - redecorating your room
  - shopping for groceries
  - planning a party

## Vocabulary Strategy: Using Context Clues

When you encounter an unfamiliar word, look at its **context**—or the surrounding words, phrases, or sentences—to try to understand its meaning. Look at the following example:

**We have a long way to go. Many weeks and months and years of long, *tedious* work lie ahead.**

The work described as “tedious” is also described as “long” and lasting for “many weeks and months and years.” Work that lasts a very long time has the potential to be difficult, boring, or tiring. Checking the word’s meaning in the dictionary confirms that *tedious* means “tiresome” or “boring.”

**Practice and Apply** Reread Kennedy’s speech and find the following words: *host*, *substantial*, *impairment*, *profound*. Look at the surrounding sentences for clues to each word’s meaning. Then fill out a chart like the one shown.

Word	Context Clues	Guessed Definitions	Dictionary Definition
<b>host</b> (lines 21–24)			
<b>substantial</b> (lines 31–36)			
<b>impairment</b> (lines 64–68)			
<b>profound</b> (lines 73–78)			

## Language Conventions: Capitalization

In your writing, you will need to apply the rules of capitalization to **proper nouns**—the names of specific people, places, and things—including organizations, historical documents, and events. In the following example, note which proper nouns are capitalized.

**In “Remarks at the Dedication of the Aerospace Medical Health Center,” President Kennedy honored the Brooks Air Force Base School of Aerospace Medicine. He also mentioned that Americans demonstrated “mastery of the skies” in World War I, World War II, and the Korean War.**

Note that when writing a title, the articles *and* and *the* remain lowercase, as do the prepositions *at* and *of*. The chart below shows three types of proper nouns that require capitalization. When events or organizations are abbreviated, their abbreviations are also capitalized.

Capitalization of Proper Nouns		Abbreviations
Organizations	American Library Association	ALA
	World Health Organization	WHO
Events	World War II	WW II
	Presidents’ Day	
Documents	Bill of Rights	
	Declaration of Independence	

**Practice and Apply** These sentences include proper nouns that lack correct capitalization. In each sentence, indicate which proper nouns should be capitalized. Consult reference materials for terms or titles that are unfamiliar to you.

- Each January, the President of the United States delivers a speech called the state of the union.
- Once a year, we observe Martin Luther King Jr. day to celebrate the great civil rights leader.
- In 1969, Apollo 11 was the first manned space mission to land on the Moon. The details of the mission are preserved in a document called the Apollo 11 flight plan.
- In 2011, five top scientists were selected by nasa, the national aeronautics and space administration, to investigate discoveries on the planet Mars.

**Background** Today, concerns over the ocean environment and potential economic and technological benefits are spurring greater interest in deep-sea exploration. **Philippe Cousteau** (b. 1980) is the grandson of Jacques Cousteau, the explorer whose 1960s television show revealed undersea wonders. Philippe Cousteau shares his grandfather's passion for ocean conservation, and he reports regularly on environmental and humanitarian stories from around the world.



# Why Exploring the Ocean Is Mankind's Next Giant Leap

Commentary by Philippe Cousteau



**SETTING A PURPOSE** As you read, consider whether Philippe Cousteau's reasons for further ocean exploration are valid. Write down any questions you may have while reading.

“Space . . . the final frontier.” Not only has this classic phrase dazzled the many millions of fans of the Star Trek franchise, some could argue it has defined a big part of the American ideal for the last 50 years. The 1960s were dominated by the race to the moon and Americans were rightfully proud to be the first nation to make it there.

However, another incredible feat happened in 1960 that is largely forgotten today. For the first time in history, on January 23, 1960, two men, Lt. Don Walsh and Jacques Picard, descended to the deepest part of the ocean, the bottom of the Challenger Deep in the Mariana Trench located in the western Pacific Ocean. While this feat made international news, the race to the depths of this planet was quickly overshadowed by the race to the moon—and no one has ever gone that deep since.

And for the last 50 years, we have largely continued to look up. But that trend may be changing.

In July 2011, the space shuttle program that had promised to revolutionize space travel by making it (relatively)

20 affordable and accessible came to an end after 30 years. Those three decades provided numerous technological, scientific and **diplomatic** firsts. With an estimated price tag of nearly \$200 billion, the program had its champions and its detractors. It was, however, a source of pride for the United States, capturing the American spirit of innovation and leadership.

With the iconic space program ending, many people have asked, “What’s next? What is the next giant leap in scientific and technological innovation?”

30 Today a possible answer to that question has been announced. And it does not entail straining our necks to look skyward. Finally, there is a growing recognition that some of the most important discoveries and opportunities for innovation may lie beneath what covers more than 70 percent of our planet—the ocean.

You may think I’m doing my grandfather Jacques Yves-Cousteau and my father Philippe a disservice when I say we’ve only dipped our toes in the water when it comes to ocean exploration. After all, my grandfather co-invented the modern SCUBA system and “The Undersea World of  
40 Jacques Cousteau” introduced generations to the wonders of the ocean. In the decades since, we’ve only explored about 10 percent of the ocean—an essential resource and complex environment that literally supports life as we know it, life on earth.

We now have a golden opportunity and a pressing need to recapture that pioneering spirit. A new era of ocean exploration can yield discoveries that will help inform everything from critical medical advances to **sustainable** forms of energy. Consider that AZT, an early treatment  
50 for HIV, is derived from a Caribbean reef sponge, or that a great deal of energy—from offshore wind, to OTEC (ocean thermal energy conservation), to wind and wave energy—is yet untapped in our oceans. Like unopened presents under the tree, the ocean is a treasure trove of knowledge. In addition, such discoveries will have a tremendous impact on economic growth by creating jobs as well as technologies and goods.

**diplomat**

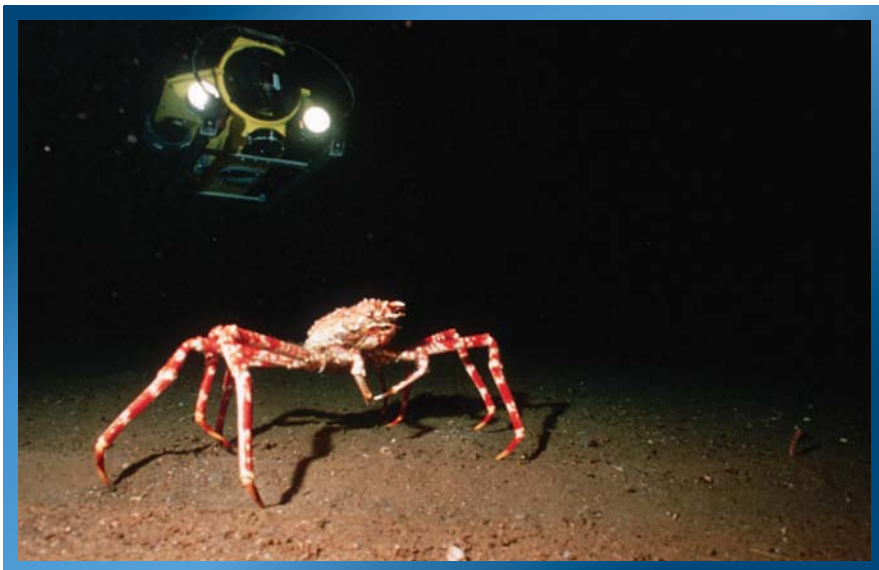
(dīp´lə-măt´) *n.*

A *diplomat* is a person appointed by a government to interact with other governments.

**sustain**

(sə-stān´) *v.* If things *sustain*, they remain in existence.





A submersible, a craft designed for deep-sea research, glides just above the ocean floor.

In addition to new discoveries, we also have the opportunity to course correct when it comes to **stewardship** of our oceans. Research and exploration can go hand in glove<sup>1</sup> with resource management and conservation.

Over the last several decades, as the United States has been exploring space, we've **exploited** and polluted our oceans at an alarming rate without dedicating the needed time or resources to truly understand the critical role they play in the future of the planet. It is not trite to say that the oceans are the life support system of this planet, providing us with up to 70 percent of our oxygen, as well as a primary source of protein for billions of people, not to mention the regulation of our climate.

Despite this life-giving role, the world has fished, mined and trafficked the ocean's resources to a point where we are actually seeing dramatic changes that are seriously impacting today's generations. And that impact will continue as the world's population approaches 7 billion people, adding strain to the world's resources unlike any humanity has ever had to face before.

In the long term, destroying our ocean resources is bad business with devastating consequences for the global economy, and the health and sustainability of all

**steward**

(stōō'ərd) *n.* A *steward* is a person who supervises and manages something.

**exploit**

(ĕk'sploit') *v.* If you *exploit* something, you use it selfishly.

<sup>1</sup> **hand in glove:** in close combination with something else.

80 creatures—including humans. Marine spatial planning, marine sanctuaries, species conservation, sustainable fishing strategies, and more must be a part of any ocean exploration and conservation program to provide hope of restoring health to our oceans.

While there is still much to learn and discover through space exploration, we also need to pay attention to our unexplored world here on earth. Our next big leap into the unknown can be every bit as exciting and bold as our pioneering work in space. It possesses the same “wow” factor:  
90 alien worlds, dazzling technological feats and the mystery of the unknown. The United States has the scientific muscle, the diplomatic know-how and the entrepreneurial<sup>2</sup> spirit to lead the world in exploring and protecting our ocean frontier.

Now we need the public demand and political will and bravery to take the plunge in order to ensure that the oceans can continue to provide life to future generations.

Today is a big step in that direction and hopefully it is just the beginning.

**COLLABORATIVE DISCUSSION** What does Philippe Cousteau want you to realize after reading this commentary? What does he want you to do? Is his evidence convincing? Talk about your ideas with other group members.

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<sup>2</sup> **entrepreneurial** (ɒnˈtrə-prə-nɔ̃rˈeɪəl): business-starting.

## Analyze Structure: Sound Reasoning

Strong arguments use sound reasoning and evidence to support any claims. A carefully constructed written argument includes the following elements:

- **claim:** the writer's position on an issue or problem
- **reasons:** logical statements that explain an action or belief
- **evidence:** facts, examples, quotations, experiences, and other pieces of information that support the claim
- **counterargument:** reasons and evidence given to disprove an opposing viewpoint

An argument may appear to be persuasive, but it may be based on faulty reasoning. A **logical fallacy** is an error in reasoning that often starts with a false assumption or mistaken beliefs. Here are a few logical fallacies:

Logical fallacy	Definition	Example
<b>Circular reasoning</b>	Repeating an idea rather than providing evidence.	I am too tied to my cell phone because I can't put it down.
<b>Either/or fallacy</b>	A statement that suggests there are only two choices available in a situation that really offers more than two options.	Either the city should provide recycling bins or throw out the Recycling Act.
<b>Overgeneralization</b>	A generalization that is too broad.	A ballet dancer would be a natural at gymnastics.

Assess the reasoning in an argument by determining whether

- the argument presents a clear claim
- the reasons make sense and are presented in a logical order
- the evidence is valid and adequately supports the claim
- there are no instances of logical fallacies or faulty reasoning

## Determine Meanings

The **tone** of a written work expresses the author's attitude toward his or her subject. For example, the tone can be described as angry, sad, or humorous. An author's choice of words, phrases, and details signal the tone of the work.

This sentence from Philippe Cousteau's commentary includes words that reveal his attitude about ocean exploration:

**We now have a golden opportunity and a pressing need to recapture that pioneering spirit.**

What words in this sentence show an enthusiastic tone?



## Analyzing the Text

### Cite Text Evidence

Support your responses with evidence from the text.

- 1. Compare** What comparison does the author develop in the first five paragraphs, and what is his purpose?
- 2. Interpret** Reread lines 26–34. Which sentence presents the author’s claim? Assess the clearness of the claim by restating it in your own words.
- 3. Assess Reasoning** Reread lines 45–56. Do the examples of support seem valid? Explain.
- 4. Infer** Reread lines 61–84. What is the author’s tone? Which words and phrases in the paragraphs reveal that tone?
- 5. Analyze** How does the author describe both past events and future events to persuade readers to agree with him?
- 6. Evaluate** Examine lines 85–93. How sound is the author’s reasoning here? Explain your assessment.

## PERFORMANCE TASK



### Speaking Activity: Informal Debate

Philippe Cousteau begins by mentioning the 1960 exploration of the Mariana Trench. Would further exploration of this deep-sea region be worthwhile? Divide your group into two teams to informally debate that question.

In an informal debate, speakers from each side take turns presenting and supporting valid claims and countering opposing claims. The whole group can decide on the

rules to follow. You may want to use a moderator, for example, and have a time limit for each speaker.

- First, research the Mariana Trench and any attempts to explore it in recent years.
- Investigate the potential for benefits in exploring the region.
- Identify the potential risks involved. Find out if any issues or problems have been reported.
- Listen well to any opponent’s points to help you prepare your responses.



## Critical Vocabulary

**diplomat**      **sustain**      **steward**      **exploit**

**Practice and Apply** Choose the situation that is the better match with the meaning of the vocabulary word. Give your reasons.

1. **diplomat**
  - a. Leaders discuss policy with leaders of other countries.
  - b. Political leaders are chosen on Election Day.
2. **sustain**
  - a. Laws limit the kinds of fish that can be caught.
  - b. Fishing boats overfish local fishing stocks.
3. **steward**
  - a. The city ignores its local fishing industry.
  - b. Citizens rely on their city to clean up polluted areas.
4. **exploit**
  - a. Young children attend school for six hours a day.
  - b. Young children work long hours in factories.

## Vocabulary Strategy: Prefixes

A **prefix** is a word part added before a word or a root. Readers can use their knowledge of prefixes to analyze words and find familiar parts and relationships. This chart shows two common prefixes.

Prefix	Meaning	Example Words
dis-	not, lack of, opposite of	dishonest, disgrace, disinfect, discourage, dispute, distract
ex-	not, out, away from	exchange, exhale, exclude, expose, extract, external

Notice the words with prefixes in this sentence from Cousteau’s commentary:

**You may think I’m doing my grandfather Jacques Yves-Cousteau and my father Philippe a disservice when I say we’ve only dipped our toes in the water when it comes to ocean exploration.**

You can see that *disservice* has the prefix *dis-*. A *disservice* is the opposite of a helpful service. The word *exploration* has the prefix *ex-* before a Latin root; the original meaning of the Latin word is “to search out.”

**Practice and Apply** Complete each word with the prefix *dis-* or *ex-*. Check a print or digital dictionary to make sure the word makes sense.

1. People have always \_\_\_**ploited** natural resources.
2. Marine animals that are \_\_\_**posed** to pollutants may become ill.
3. Overfishing may cause some fish to become \_\_\_**tinct**.
4. There are \_\_\_**tinct** actions to take to protect oceans.

## Language Conventions: Adjective Clauses

An **adjective** is a part of speech that modifies a noun or a pronoun. It answers the question *What kind? Which? or How many?* A **clause** is a group of words that has a subject and a predicate—the two main parts of a complete sentence. An **adjective clause** acts like an adjective to modify a noun or pronoun in the rest of the sentence.

In an adjective clause, the subject is often a **relative pronoun**—a pronoun that relates, or connects, adjective clauses to the words they modify in a sentence. Relative pronouns include *who, whom, whose, which, and that*. Notice the relative pronoun in this sentence from “Why Exploring the Ocean Is Mankind’s Next Giant Leap”:

**However, another incredible feat happened in 1960 that is largely forgotten today.**

The relative pronoun *that* introduces the adjective clause *that is largely forgotten today*. The clause modifies the noun *feat*, answering the question *What kind of feat?*

When you write, you can use adjective clauses to tell more about a noun or a pronoun in a sentence. The adjective clause is underlined in each of these sentences.

**Lt. Don Walsh and Jacques Piccard descended to Challenger Deep, which is the deepest part of the ocean.** (The adjective clause tells more about *Challenger Deep*.)

**Jacques Piccard, who was a Swiss engineer, developed underwater vehicles.** (The adjective clause tells more about *Jacques Piccard*.)

**More people know about the astronauts who traveled to the moon than about these two explorers.** (The adjective clause tells more about *astronauts*.)

**Practice and Apply** Use the relative pronoun in parentheses to introduce an adjective clause that tells about the underlined noun or pronoun. Write the new sentence.

1. Scientists study the ocean. (who)
2. Ocean exploration will be the next giant leap. (that)
3. Discoveries about ocean life will affect everyone. (who)
4. Our pioneering spirit is still strong. (which)



**Background** For many years, it was nearly impossible to study life at the bottom of our oceans. Therefore, very little was known about deep-sea habitats. But recent 20th-century technological advances have allowed scientists to begin to discover surprising forms of life in the ocean depths. In her writing, **Cheryl Bardoe** likes to draw back the curtain to reveal how scientists explore the unknown. She presently lives in Chicago, Illinois, where she once worked at the city's famous Field Museum of Natural History.



from

# Living in the Dark

Science Article by Cheryl Bardoe

**SETTING A PURPOSE** As you read, notice how scientific study has altered past beliefs about Earth's oceans. Write down any questions you have while reading.

## When a Whale Falls

Imagine the moment when a great blue whale, undernourished and exhausted from migrating, grunts out its last breath somewhere in the Pacific Ocean.

Then, as the pressure of the surrounding water squeezes the last air reserves from the whale's lungs, this massive creature begins to sink.

It plunges 700 feet (200 meters) through the ocean's top layer, the warm "sunlight zone" where algae kick-start life's food chain with photosynthesis. It drops another 2,600 feet (800 meters) through the cold twilight zone, where no plants live and fish have extra-large eyes to catch the faintest glimmers of sun. It descends down, down, down through 3,300 feet (1 kilometer) or more of the midnight zone. Here, temperatures hover close to freezing; deep-sea creatures must

flash their own lights to break the darkness; and the weight of the water feels like about 500 bowling balls pressing in on every square inch of the whale’s carcass.

The tiny flecks of dead plankton that are called marine snow may drift for months before reaching the ocean floor.

20 But this great blue whale plummets so quickly that scavengers barely get a nibble. Its 160-ton carcass thumps down nearly intact, depositing as many nutrients as several thousand years’ worth of marine snow—all in one fell swoop.

This **cache** of resources, called a whale fall, will become the center of a unique habitat. First, it attracts deep-sea scavengers. Hagfish—unsightly creatures also called slime eels—wriggle inside the carcass and begin to eat it from the inside out. Squat lobsters, sleeper sharks, and crabs tear at the whale’s flesh and scatter crumbs into nearby sediments. Then  
30 mollusks colonize those sediments. Meanwhile, fantastical worms, slugs, and bacteria bore into the whale’s bones to feast on fatty marrow.

Finally come bacteria that transform the chemicals leaking out of the decaying bones into food for themselves and others. Much as plants use energy from the sun to make their own nourishment, these “chemosynthetic” bacteria use energy from chemical reactions to create the basic building blocks of life. Within months this whale carcass may support more than 40,000 creatures; it might keep this chemosynthetic ecosystem  
40 going for up to a century.

The living things that take up residence on this whale fall are similar to those that live near undersea **geysers** (called hydrothermal vents) or cracks that leak natural gas into the ocean (called cold seeps). Together, these three habitats have completely changed how scientists think about the basic rules for life.

**cache**

(kăsh) *n.* A cache is an amount of something that has been hidden away.

**geyser**

(gē’zər) *n.* A geyser is a natural hot spring that shoots hot water and steam into the air.

## Life Where Life Isn’t Possible

For most of human history, the ocean’s secrets have been beyond reach. Gazing across the water’s rippling surface, who could have guessed what truly lay beneath? In the 1840s,  
50 British naturalist Edward Forbes dredged the Aegean Sea<sup>1</sup> 100 times to find out. The deeper his device went, the less it

<sup>1</sup> **Aegean Sea** (ĭ-jē’ən sē): an arm of the Mediterranean Sea between Greece and Turkey.



dragged up, and Forbes concluded that nothing at all lived below 1,600 feet (500 meters) deep. This theory fit perfectly with what others had observed on land. If the extreme climates of the Arctic and high mountain peaks snuffed out life, then the cold, dark, deep sea must be empty too.

“ Within months this whale carcass may support more than 40,000 creatures. ”

Over the next century, people challenged this theory. Corals were hauled up from 2,500 feet (750 meters) deep; starfish and oysters were gathered from 7,500 feet (2,300 meters). One expedition collected 4,700 new species from as deep as 16,000 feet (5,000 meters)—that’s more than three miles underwater! Because photosynthesis isn’t possible at such depths, scientists decided that marine snow provided the base of the food chain for these animals. Sure, they acknowledged, life was possible in the deep sea. But scientists assumed that life forms living off such scraps would be **meager**. And so they continued to believe that life couldn’t survive in the most extreme ocean-floor conditions.

Then everything changed.

In 1977, a team of geologists squeezed into the research mini-sub called *Alvin*, hoping to confirm whether geysers (like Old Faithful in Yellowstone National Park) existed on the ocean floor. The hydrothermal vents were there, all right. So was a “Garden of Eden,”<sup>2</sup> as the scientists called it, of mussels, anemones, and 7-foot (2-meter) worms with crimson, feather-like plumes. The stunned researchers gathered samples and called biologists at the Woods Hole Oceanographic Institute (WHOI) in Massachusetts.

**meager**  
(mē'gər) *adj.* If something is *meager*, it is small or deficient in quantity.

<sup>2</sup> **Garden of Eden:** the garden that was the first home of Adam and Eve according to the Bible.



On the sea floor, a spider crab, mussels, and worms are revealed by the light of a submersible vehicle.

“It was predicted that vents would exist,” explains Santiago  
80 Herrera, a biologist currently working at WHOI. “What wasn’t  
predicted was that there would be anything living there.”  
Scientists had found an ecosystem that didn’t rely on the sun  
for energy. Not only that, but its inhabitants were thriving in a  
place that would be toxic for any other known organism. Ideas  
about the origins and requirements for life on Earth were  
suddenly turned upside down.

## Hydrothermal Vents

You can often find undersea volcanic activity where Earth’s  
tectonic plates are pulling apart. As the planet’s crust  
stretches thin, molten rock breaks through to create new  
90 crust. Meanwhile, water soaks into the crust through nearby  
cracks, dissolving rocks and heating up to temperatures of 660  
degrees Fahrenheit (350 degrees Celsius) before rising again  
through a “chimney” on the ocean floor. When the mineral-  
rich, super-hot water from the geyser meets the oxygen-rich,  
frigid water of the deep sea, a chemical reaction is triggered  
that forms hydrogen sulfide. This smells like rotten eggs and  
looks like black smoke spewing into the ocean.

### tectonic

(tĕk-tŏn'ĭk) *adj.*  
If something is  
*tectonic*, it relates to  
the deformation of  
Earth’s rocky crust.

Scientists now know that some bacteria release energy by breaking down these sulfides spewing from the geysers. These  
100 same bacteria then harness that energy to turn carbon dioxide and oxygen from the ocean water into sugars—that is, food energy. Ta-da! Here’s the foundation for an entire deep-sea food chain.

These chemosynthetic bacteria may be food for other creatures themselves, or may live in symbiosis<sup>3</sup> with other deep-sea dwellers. The giant tube worms, for example, have no mouths or stomachs, but get their food by hosting billions of bacteria within their bodies. Many clams and mussels living near these vents get their food the same way.

110 Hydrothermal vents have been a constant source of surprises, ranging from the single-celled microbe that actually lives *inside* a vent (and tolerates temperatures of 250 degrees Fahrenheit, or 120 degrees Celsius) to the white crab with such furry arms that it was dubbed the “yeti crab.”

## Cold Seeps

Scientists discovered a second type of deep-sea chemosynthetic habitat in 1984. This time, bacteria were breaking down the hydrogen sulfide and methane that oozed from cracks in the ocean floor near Monterey Bay, California. Scientists have since identified three sources for these “cold seep”  
120 communities: large deposits of oil or natural gas beneath the seabed; deep trenches created by one tectonic plate sinking below another; and undersea landslides or erosion that expose chemical deposits in the seabed.

Cold seep communities play a major role in shaping Earth’s climate, Herrera says. “If they did not exist, a lot of methane would end up in the atmosphere.” Without bacteria breaking down methane from the ocean floor, this greenhouse gas<sup>4</sup> would escape from the ocean and make Earth warmer.

130 Cold seep habitats develop like those at hydrothermal vents do, but with different species. Chemosynthetic bacteria arrive first, forming large white mats on the sea floor. Crabs and shrimp come to scavenge dead bacteria, and mussels arrive that live with symbiotic bacteria. Over time, the

<sup>3</sup> **symbiosis** (sím´bē-ō’sīs): a relationship between two living things that benefits both of them.

<sup>4</sup> **greenhouse gas**: a gas in the atmosphere that traps heat.

chemosynthetic bacteria produce a hard material called carbonate, which offers tube worms a firmer ground to grip than the muddy sea floor. Then tube worms build up their hard, protective branches, providing living space for even more organisms.

## Whale Bones, Stepping Stones

140 So far, whales are the only animals we know of that can affect life on the ocean floor the same way shifting tectonic plates do. Besides their hefty size, whales are unique in that fats make up 60 percent of their bone weight. (For comparison, humans are born with almost no fat in their bones.) In life, this bone fat helps whales float and store energy. In death, these fats are **decomposed** by bacteria that give off hydrogen sulfide—sound familiar? Once the chemosynthetic community that lives off these sulfides is in full swing, whale falls host an average of 185 different species—the highest number yet observed in such deep-sea communities.

150 Whale falls might explain how species travel across vast ocean spaces from one hydrothermal vent or cold seep to the next. “There are specialists in each habitat, but there is also overlap,” says Craig Smith, a professor at the University of Hawaii, who discovered the first whale fall in 1987. “Some species may use whale falls as stepping stones.”

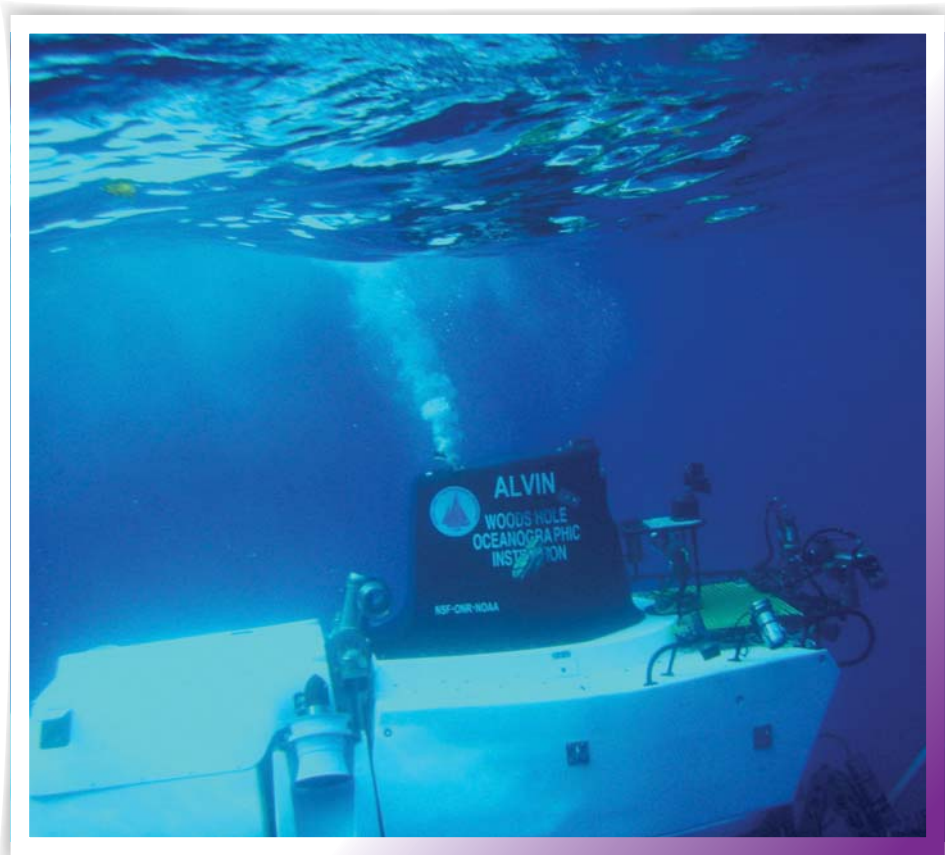
Smith says that seeing the same kinds of communities at hydrothermal vents, cold seeps, and whale falls shows us how connected the oceans really are. “The connectivity is across widespread spaces from seemingly isolated habitats.”

**decompose**  
(dē'kəm-pōz') v.  
When things *decompose*, they decay and break down into their basic parts.

## At the Whims of the Waves

160 Thirty-five years have passed since the discovery of the first hydrothermal vent—but study of the deep sea has really just begun. The main obstacle is getting there.

Fieldwork in the ocean requires tremendous resources. For starters, scientists need a ship and a crew. Reaching a field site may take weeks at sea. Then scientists need high-tech equipment to open a window onto the watery world. Even if everything comes together, success is at the whims of weather and waves. Herrera remembers one expedition where an unmanned, remotely operated vehicle (called an ROV) drifted  
170 into the wrong place at the wrong time and was destroyed



The *Alvin* submersible begins its descent under water.

by the ship's propellers. "Every time you put something overboard on a ship," he says, "it's basically a miracle that you get it back."

Under such conditions, scientists must balance the thrill of discovery with persistence and patience. Smith knows what that's like. His team discovered the first whale fall at the tail end of the last *Alvin* dive on a research trip. "Within ten minutes of *Alvin's* return, we knew what we had," he says, "but we had to wait a year to get back and investigate it."

180

Fortunately, improvements in technology are giving scientists more ocean access than ever. In 2010, Herrera sailed to the Coral Triangle, near Indonesia. This is the most diverse marine ecosystem on the planet, and scientists wonder if the deep-sea communities underlying the coral reefs there might be the reason. Herrera was one of only a few scientists on the ship, but video footage of his ROV dives was transmitted to Massachusetts, Maryland, and Washington, plus Canada

and Indonesia. Dozens of scientists worldwide witnessed and discussed the dives as if they were all present on the ship.

190 The goal of this expedition was to explore unseen waters and identify places worth returning to for in-depth research. Scientists saw far more than they expected. Monitoring video from most exploratory dives means watching hours of flat and empty (which is to say, boring) seabed scroll by, hoping to spot something exciting. But on this expedition, Herrera says, “we were never bored because we were constantly seeing amazing species. We suspect this is one of the areas of highest biodiversity<sup>5</sup> on Earth.” Scientists will definitely be going back—just as soon as they can find the money to fund  
200 another expedition.

To date, scientists have identified more than 1,300 species in deep-sea chemosynthetic habitats. These organisms have introduced us to completely new ways of life and expanded our view of how adaptable life can be. Yet they raise as many questions as they answer. Smith predicts that scientists will find life popping up in even more surprising locations: “We haven’t exhausted the list of processes that create these kinds of ecosystems.”

210 The oceans cover 70 percent of Earth’s surface, yet less than 5 percent of this resource has been explored. “This is definitely worth investing your whole life to study,” Herrera says.

**COLLABORATIVE DISCUSSION** The author tells how scientists react to evidence that challenges ideas they had long accepted as possibilities. How have scientists reacted to the discoveries of deep-sea habitats? Talk about your ideas with other group members.

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<sup>5</sup> **biodiversity:** the range of living things within an environment.



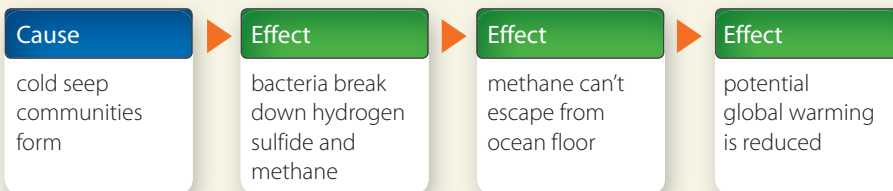
## Analyze Structure

ELA RI.7.3, RI.7.5  
ELD PI.7.6, PII.7.1

Science writing usually presents relationships between events or ideas. Events can show **cause-and-effect relationships**, in which one event brings about, or causes, the other. The event that happens first is the **cause**; the one that follows is the **effect**.

Readers of science writing can grasp cause-and-effect relationships by thinking about what happens and why. One of the main clues readers can look for are **signal words**. Words or phrases that signal causes are *due to*, *because of*, or *since*. Words or phrases that signal effects are *as a result*, *therefore*, and *led to*. Sometimes the cause-and-effect relationship is not obvious, and readers must look deeper for **implied** causes and effects. This involves making inferences based on clues in the text.

Organizing information into a chart can help you to connect causes and effects. This chart shows a cause-and-effect chain based on ideas in the section “Cold Seeps” of the excerpt from “Living in the Dark.”



Reread lines 1–13 from the section “When a Whale Falls.” Organize the information into a chart that shows a cause-and-effect chain.

## Determine Central Ideas and Details

ELA RI.7.2, RI.7.3  
ELD PI.7.6

**Paraphrasing** is the restating of information in your own words. When you read science texts, you may encounter complex ideas and new vocabulary. To check your understanding, use paraphrasing to restate the language in the text. For example, reread lines 33–40 of the excerpt from “Living in the Dark.” Then read this paraphrase of the sentence comparing green plants and deep-sea bacteria:

**Plants make their own food using the sun’s energy, but these “chemosynthetic” bacteria use chemical energy to make food.**

Look back at lines 33–40 again. Tell what a “chemosynthetic ecosystem” is in your own words.



## Analyzing the Text

### *Cite Text Evidence*

Support your responses with evidence from the text.

- 1. Cause-Effect** What are the major effects of a giant whale's death on ocean life?
- 2. Cause-Effect** Reread lines 87–97. Note the cause-and-effect connections in that paragraph. Paraphrase the information in the form of a chart that shows the cause-and-effect chain. Label the first box as “Cause” and complete it with this entry:  
Water soaks into cracks in Earth's stretched crust.
- 3. Compare** What are the three types of habitats described in this article, and how are they alike?
- 4. Interpret** Reread lines 104–109. How would you paraphrase the information in the first sentence of this paragraph?
- 5. Cite Evidence** Reread lines 79–86 from the section “Life Where Life Isn't Possible.” What ideas were “suddenly turned upside down,” and why?
- 6. Evaluate** Why might the author have decided to end the article using the scientist's quotation?

## PERFORMANCE TASK



### **Writing Activity: Argument**

Think about Santiago Herrera's statement at the end of the excerpt from “Living in the Dark.” Why does he have that opinion? Why might someone else have a different opinion? Do you agree with Herrera's statement? Use your answers to those questions to write a one- to three-paragraph argument.

- In your introduction, state your opinion, or claim, clearly.
- In the rest of the essay, present valid reasons for your opinion and support them with evidence from the text and other sources that you can rely on.
- Try to present and refute one counterargument to your claim.

## Critical Vocabulary

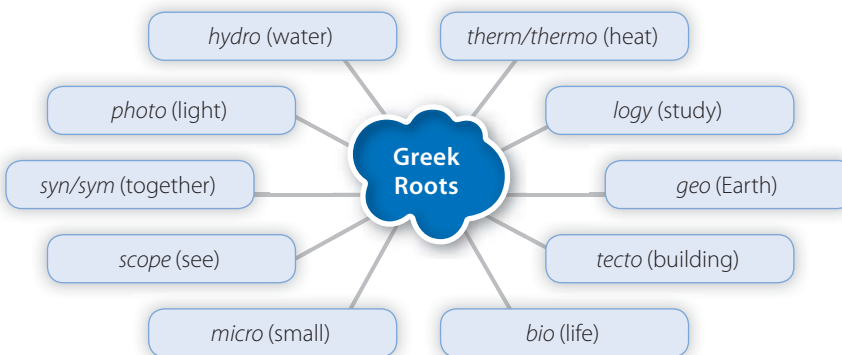
**cache**      **geyser**      **meager**      **tectonic**      **decompose**

**Practice and Apply** Complete each sentence to show that you understand the meaning of the vocabulary word.

1. It's wise to keep a **cache** of . . .
2. Scientists study **geysers** to learn . . .
3. If you ate a **meager** meal, you . . .
4. Everywhere on Earth, **tectonic** . . .
5. Bacteria will **decompose** . . .

## Vocabulary Strategy: Greek Roots

A **root** is a word part that came into English from an older language. You can check a print or digital dictionary to learn about roots; the entry for a word often gives details about the word's origin. Roots from ancient Greek are often called **combining forms** because they are combined to form words, especially terms in science and technology.



In the excerpt from "Living in the Dark," you read about Earth's tectonic plates. What do tectonic plates have to do with the meaning of the Greek root *tecto*, "building"? The movements of the plates are responsible for building continents, mountains, and oceans.

**Practice and Apply** Read each phrase and identify the word made from Greek combining forms. Refer to the chart for the root's meaning. Then define the phrase. Use a print or digital dictionary to check your ideas.

1. hydrothermal vents
2. photosynthesis in green plants
3. microscopic organisms
4. symbiotic bacteria
5. hydrogeological events

## Language Conventions: Verbal Phrases

A **verbal** is a verb form that is used as a noun, an adjective, or an adverb. An **infinitive** is a verbal that begins with *to* and has the base form of a verb. The infinitive is underlined in each of these sentences.

- Our plan is to sail. (The infinitive acts like a noun and tells what *our plan* is.)
- There may be whales to photograph. (The infinitive acts like an adjective to modify *whales* and tell *what kind*.)
- To breathe, whales come to the surface. (The infinitive acts like an adverb to modify *come* and tell *why*.)

A **verbal phrase** is made of a verbal and any other words that complete its meaning. The **infinitive phrase** is underlined in each of these sentences. The whole phrase in each sentence acts the same way as the infinitive alone.

- Our plan is to sail tomorrow.
- There may be whales to photograph from the boat.
- To breathe the air they need, whales come to the surface.

Note the infinitive phrase in this sentence from “Living in the Dark”:

**Meanwhile, fantastical worms, slugs, and bacteria bore into the whale’s bones to feast on fatty marrow.**

The infinitive phrase acts like an adverb to modify the verb *bore*. It tells why bacteria bore into the whale’s bones.

**Practice and Apply** Read each group of words and the question in parentheses. Add an infinitive phrase to answer the question and complete a sentence using the words. Refer to the excerpt from “Living in the Dark” for ideas to include.

1. deep-sea scientists want (What do they want?)
2. fish of the deep sea have extra-large eyes (Why do they have such eyes?)
3. crabs and shrimp come to the ocean floor (Why do they come?)
4. scientists need equipment (What kind of equipment?)
5. the goal of a deep-sea expedition (What is the goal?)

A child in a yellow shirt and red skirt holds a blue balloon shaped like the Earth. The background is a vibrant, abstract splash of blue, green, and yellow. The title 'Your World' is written in large white letters across the top.

# Your World

Poem by Georgia Douglas Johnson

**Georgia Douglas Johnson** (1880–1966) was one of the most famous African American women writers of the early 1900s. She is associated with the Harlem Renaissance—an African American literary and cultural movement of the 1920s and 1930s. Johnson wrote four volumes of poetry as well as plays and fiction.

**SETTING A PURPOSE** Sometimes a poem contains a message designed to inspire. As you read, consider the poet’s message and how it may inspire others to take risks.

Your world is as big as you make it  
I know, for I used to abide  
In the narrowest nest in a corner  
My wings pressing close to my side.

5 But I sighted the distant horizon  
Where the sky-line encircled the sea  
And I throbbed with a burning desire  
To travel this immensity.

I battered the cordons<sup>1</sup> around me  
10 And cradled my wings on the breeze  
Then soared to the uttermost reaches  
With rapture, with power, with ease!

**COLLABORATIVE DISCUSSION** In what ways does this poem teach a lesson about risk-taking? Share your ideas with other group members.

<sup>1</sup> **cordons** (kôr´dnz): lines or borders stretched around an area, indicating that access is restricted.



## Determine Meanings

In the poem “Your World,” the poet conveys a comparison of two unlike things through the **speaker**, or the voice that “talks” to the reader. Because this figurative comparison is carried through the entire poem, it is called an **extended metaphor**, a figure of speech that compares two essentially unlike things at some length and in several ways.

The poet also uses **imagery**, words and phrases that appeal to the senses, to engage the reader and develop the extended metaphor. In these two lines, the descriptions encourage readers to use their senses:

**line 6: Where the sky-line encircled the sea**

**line 10: And cradled my wings on the breeze**

Look back at the poem. Find additional examples of imagery and lines that give clues about the extended metaphor.

## Analyzing the Text

ELA RL.7.1, RL.7.2, RL.7.4, W.7.2, W.7.9a

ELD PI.7.6, PI.7.8, PI.7.10

### Cite Text Evidence

Support your responses with evidence from the text.

- 1. Interpret** What words in the second stanza appeal to the senses?
- 2. Interpret** What does the speaker mean when she says, “I battered the cordons around me”?
- 3. Compare** Through the extended metaphor, what comparison does the poet make?
- 4. Draw Conclusions** A poem’s **theme** is a message about life or human nature that the poet shares with the reader. What is the theme of “Your World”?

## PERFORMANCE TASK



**Writing Activity: Analysis** Think about the extended metaphor in this poem. Write at least one paragraph analyzing the extended metaphor. These questions may help you organize your thoughts and writing:

- What words and phrases show the comparison throughout the poem?
- Why might the poet have chosen this comparison?
- What feelings are suggested by the comparison?



To help you complete this task, use:

- Writing Arguments
- Giving a Presentation

## Present an Argument

Persuasive speeches such as John F. Kennedy’s “Remarks at the Dedication of the Aerospace Medical Health Center” can have powerful effects. In the following activity, you will draw from Kennedy’s speech and other texts to prepare and present an argument. You will try to persuade others whether major exploration is worth the risk.

### A successful argument

- contains an engaging introduction that establishes the claim
- supports key points with reasoning and relevant evidence pulled from a variety of solid, credible sources
- uses language that effectively conveys ideas and adds interest
- concludes by forcefully summing up the claim

### PLAN

**Choose Your Position** Think about the texts you read in this collection and the various points made by the writers concerning risk and exploration. Then choose a position either for or against major exploration based on the risks involved, and write out your claim in a statement.

**Gather Information** Focus on the selection(s) that have information you can cite to support your position. Jot down important details that support your claim. Consider the following:

- What are your reasons for taking the position you took?
- What evidence can you use as quotes to support your claim?
- What might others say to oppose your claim? How would you try to convince them to agree with you?
- What do you want your audience to understand?

**ELA** W.7.1a–e, W.7.7, W.7.8, W.7-10, SL.7.4, SL.7.4a, SL.7.5, SL.7.6  
**ELD** PI.7.4, PI.7.9, PI.7.11, PI.7.12, PII.7.1, PII.7.2



Visit [hmfyi.com](http://hmfyi.com) to explore your topic and enhance your research.



Use the annotation tools in your eBook to find evidence that supports your claim. Save each piece of evidence to your notebook.

### ACADEMIC VOCABULARY

As you plan and present your speech, be sure to use the academic vocabulary words.

*complex*  
*potential*  
*rely*  
*stress*  
*valid*

**Do Further Research** Research additional print and digital sources to find solid, credible evidence for your argument.

- Search for facts, quotes, and statistics that support your claims.
- Try to find sources that don't agree with you. Develop a counterargument to address an opposing view.

**Organize Your Ideas** Think about how you will organize your speech. This can help you to present your ideas coherently.

**Mentor Text** Read this passage from President Kennedy's speech, which shows how word choices can engage the audience.

“It is an era which calls for action and for the best efforts of all those who would test the unknown and the uncertain in every phase of human endeavor. It is a time for pathfinders and pioneers.”

### Interactive Lessons

For help in incorporating evidence, use:

- [Writing Arguments: Creating a Coherent Argument](#)
- [Writing Arguments: Persuasive Techniques](#)

## PRODUCE



**Draft Your Argument** Use the information you have gathered to help you write your argument.

- Introduce your claim. Begin with an attention-grabbing comment or an unusual or funny quote, statistic, or story.
- Organize your reasons and evidence logically. For example, will it work better to start with your weakest or strongest argument?
- Be sure to include quotes and other data from your sources.
- Use words and phrases such as *because*, *therefore*, and *for that reason* to make your argument clearer and more cohesive.
- Conclude your argument. Summarize your main points in a restatement, and connect them to your introduction.

Write your rough draft in myWriteSmart. Focus on getting your ideas down, rather than perfecting your choice of language.

## Language Conventions: Using Pronouns for Cohesion

Cohesive writing flows smoothly from one sentence to another. Using pronouns is a cohesive way to avoid unnecessary repetition. Read the following quotation from the speech, “Remarks at the Dedication of the Aerospace Medical Health Center.”

“For this **city** has long been the home of the pioneers in the air. **It** was here that Sidney Brooks, whose memory we honor today, was born and raised.”

Notice how the pronoun *It* refers to the noun *city*, in the first sentence. This helps to connect an idea in one sentence to another.

**Prepare Visuals** Select multimedia resources to create charts, graphs, or pictures that clarify and strengthen your claims. Make sure that all visuals are large enough to be read easily.

**REVISE**

**Practice Your Argument** Present your argument aloud. Try speaking in front of a mirror, or make a recording of your presentation and listen to it. Then practice with a partner.

**Evaluate Your Argument** Work with your partner to determine whether your argument is effective.



Have your partner or a group of peers review your draft in myWriteSmart. Ask your reviewers to note any reasons that do not support the claim or lack sufficient evidence.

**Interactive Lessons**

For help in practicing your delivery, use:  
 • [Giving a Presentation: Delivering a Presentation](#)

Questions	Tips	Revision Techniques
Did I clearly state my claim?	<b>Highlight</b> the claim.	<b>Revise</b> the existing claim to make your position more clear.
Is my claim supported logically?	<b>Underline</b> the reasons. <b>Highlight</b> your evidence.	<b>Add</b> more reasons, if your argument lacks support. <b>Replace</b> weak evidence with stronger examples, facts, or quotes.
Is the style of my argument formal enough?	<b>Underline</b> any use of informal language, such as contractions.	<b>Focus</b> on specific words to improve. <b>Write</b> out any contractions to sound more precise.
Is my response to an opposing claim understandable?	<b>Highlight</b> any counterarguments. <b>Note</b> the wording of your response.	<b>Use</b> transitions to set off your counterargument from an opposing claim.
Does the conclusion have a strong restatement?	<b>Underline</b> the conclusion.	<b>Add</b> a restatement of the claim, if needed, to clarify. <b>Make</b> your point forcefully.

**PRESENT**

**Deliver Your Speech** Finalize your argument and present it to the class.

# PERFORMANCE TASK RUBRIC

## ARGUMENT

### Ideas and Evidence

### Organization

### Language

4

- The introduction grabs the audience's attention; the claim clearly states the speaker's position on an issue.
- Logical reasons and relevant evidence support the claim.
- Opposing claims are anticipated and effectively addressed with counterarguments.
- The concluding section effectively summarizes the claim.

- The reasons and evidence are organized logically and consistently throughout the speech.
- Transitions logically connect reasons and evidence to the presenter's claim.

- The speech reflects a formal style.
- Sentence beginnings, lengths, and structures vary and have a rhythmic flow.
- Sentences show cohesion through the use of pronouns to avoid repetition of nouns.
- Grammar, usage, and mechanics are correct.

3

- The introduction could do more to grab the audience's attention; the speaker's claim states a position on an issue.
- Most reasons and evidence support the speaker's claim, but they could be more convincing.
- Opposing claims are anticipated, but counterarguments need to be developed more.
- The concluding section restates the claim.

- The organization of key reasons and supporting evidence is logical in some places.
- A few more transitions are needed to clarify the relationships between ideas.

- The style becomes informal in a few places.
- Sentence beginnings, lengths, and structures vary somewhat.
- Could use more pronouns to avoid wordiness in sentences and improve cohesion.
- Some grammatical and usage errors are present.

2

- The introduction does not grab the audience's attention; the speaker's claim identifies an issue, but the position is not clearly stated.
- The reasons and evidence are not always logical or relevant.
- Opposing claims are anticipated but not addressed logically.
- The concluding section includes an incomplete summary of the claim.

- The organization of reasons and evidence is confusing in some places, and it often doesn't follow a pattern.
- Several more transitions are needed to connect reasons and evidence to the presenter's claim.

- The style becomes informal in several places.
- Sentence structures rarely vary, and some fragments or run-on sentences are present.
- Sentences lack cohesion.
- Grammar and usage are incorrect in several places, but the speaker's ideas are still clear.

1

- The introduction is confusing.
- Supporting reasons and evidence are missing.
- Opposing claims are neither anticipated nor addressed.
- The concluding section is missing.

- A logical organization is not used; reasons and evidence are presented randomly.
- Transitions are not used, making the speech difficult to understand.

- The style is inappropriate for the speech.
- Repetitive sentence structure, fragments, and run-on sentences make the speech hard to follow.
- Several grammatical and usage errors change the meaning of ideas.