

Deep Knowledge Building (6–8)

Over the course of four units, students travel through a wide range of texts and topics that grow their knowledge and skills. They begin with literary analysis in genres like mythology, poetry, and science fiction, then shift to informational reading and writing with science and social studies topics such as geology, the American Revolution, and environmental studies. Next, they return to literature, exploring fantasy, American historical fiction, and World War II texts. The year wraps up with argument writing, as students investigate world civilizations, westward expansion, and heroes in history. Through extensive reading, writing, research, and analysis, students quickly increase knowledge, develop vocabulary, and build expertise in a wide variety of disciplines.

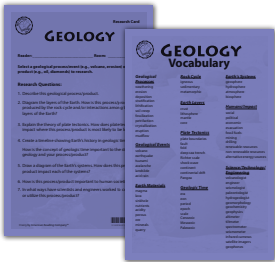
Students are guided to think about how knowledge is presented and organized when reading and writing in the same genre. Students participate in daily academic conversations with peers, respond to text-specific questions, and support their ideas with evidence, which promotes deep comprehension and collaborative knowledge building. Through its research libraries, the curriculum emphasizes reading a wide range of conceptually connected texts to rapidly build knowledge and vocabulary. Alongside whole class reading, students also choose from topically related texts to extend and deepen their study.

Every Teacher Guide includes consistent routines through structured daily lessons, unit scope and sequence and pacing guides, as well as explicit guidance on how to facilitate a comprehensive study of the structures of the genre in each unit. Teachers and students interact with physical resources and a digital curriculum designed to make implementation easy. Final projects in each unit emphasize knowledge building, proficiency in grade level ELA standards, and the growth of essential communication and presentation skills.

Every Lesson Seamlessly Integrates Content and Language Arts

Grade-Level Science and Social Studies Applied to Student Research

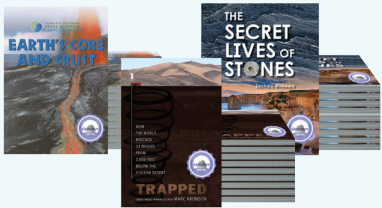
Research Card
Tier 2 & 3 Vocabulary



Grade-Level Reading and Writing Standards

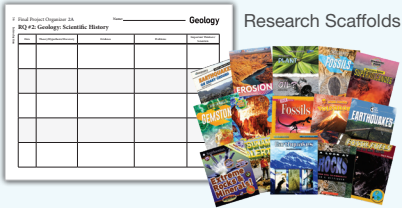
RI.6.2 Rubric	
1 pt.	Introduce the text with an objective summary that includes the topic. <i>The text ___ by ___ (is mostly about/describes/discusses/explains)...</i>
1 pt.	Identify a central idea.
1 pt.	Identify the key supporting ideas, including their relationships to this central idea.
1 pt.	Explain how the author uses particular details to develop each supporting idea.
1 pt.	Explain how the author's organizing structure contributes to the development of this central idea.
1 pt.	Conclude by summarizing how the supporting details and organizing structure supports this central idea.
6 pts.	Proficient Answer

Complex Texts and Tasks



Grade-Level Text

Coached Application



Research Library

Writing Product



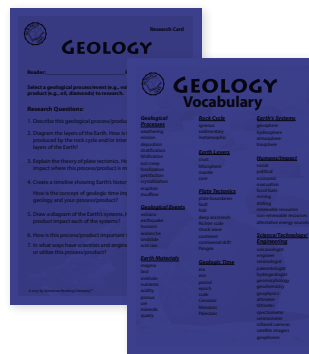
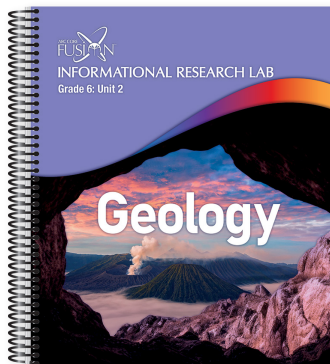
Student-Authored Text

Grade 6, Unit 2: Geology

Informational Research Unit

Why does this lesson matter when building knowledge?

Students use analysis of central ideas and supporting ideas/key details as support for comprehending complex texts about the layers of the Earth and rock cycle.



Lesson 2.2

Lesson Plan

Lesson 2.2: Central Ideas and Key Details

1. Do Now

Display the following task.
Share last night's research with a peer: *What did you learn about the layers of the Earth? About your topic? Add new information to your organizers.*

Briefly discuss as a class: *Who learned something about the layers of the Earth that the whole class should hear?*

2. Central Ideas and Key Details

Today, we will work on determining a central idea using key details. This will help you learn more from informational text and support your research with RQ #1 and this Unit.

Read/Write/Discuss Complex Text

Display "Central Idea and Key Details" and review the definitions for Topic, Key Details, and Central Idea. Students reread pages 6–12 of *Earth's Core and Crust* (up to "Earth's Magnetic Field"). Use the questions in the right-hand column during reading to support comprehension of complex text. After reading, work with students to determine how the author uses key details to communicate a central idea. (See right-hand column on the following page for sample topic and central idea.)

- Identify the **topic** of the passage. *This passage is all about...*
- Locate **key details** from the text and images. *The key details are the most important ideas. I think the key details in this section are...*
- Determine a **central idea** from these details.
- Decide whether one of the sentences in this text explicitly states the author's central idea. If not, you will have to infer it from the details and state the central idea in your own words. *A central idea of ___(title)___ by ___(author)___ is...*
- What did you like about the way the author communicated their topic, central idea, and key details? How might you imitate this in your own writing?*

Vocabulary: Display/distribute the Word Map for "interaction" and display the following task.

We have been learning about the layers of the Earth and their interactions. Let's study the word "interaction."

Work with a peer to read and add to your Word Map for this week's word. You will continue adding to this Word Map over the next few days and turn it in at the end of the week.

Discuss briefly as a class and add to a class Word Map.



Learning Goals and Comprehensible Input

Don't just repeat the Unit's goal or say today's goal. Provide written support for key information or instructions you give to the students orally.

Suggested Lesson Pacing

Do Now: 5 minutes
Whole-Group Instruction: 20–25 minutes
Application: 15–25 minutes
Exit Ticket: 5 minutes

Coaching Focus

Students can use key details in the text to determine a central idea.

You've Seen This Before: Central Idea & Key Details

Identifying the main idea and key details of a text is most likely a familiar concept from many years of informational text instruction. Pay attention to students' current proficiencies with this material and coach them toward success with increasingly sophisticated analysis of more complex texts.

Key Science Concepts & Vocabulary

Discuss the following questions, using evidence from the text to scaffold comprehension.

The Crust (pp. 6–7), after paragraph 4

- What does "density" mean? What does "denser" mean? How do you know?

The Lithosphere (pp. 7–8)

- After par. 1: *What layers or parts of layers make up the lithosphere? If "lithos" means "stone," what does "lithosphere" mean? Why does this name make sense?*
- After par. 3: *How do temperature and pressure change the closer you get to the center of the Earth?*

The Mantle (pp. 9–10)

- Before par. 3: *If "asthenos" means "without strength," in Ancient Greek, what does "asthenosphere" mean? Why does this name make sense? How are the lithosphere and asthenosphere similar and different?*

The Outer Core (p. 10)

- After par. 2: *What movement is Davis referring to? Why does she compare this movement to currents in rivers?*

The Inner Core (pp. 10–12)

- After p. 11: *What does "compress" mean? How do you know?*

3. Application

Set Focus

Continue your research on RQ #1. Be on the lookout for anything you can add to your Word Map. Be ready to share a central idea and key details for a text you read today.

Student Work

Students read. If it does not disrupt their focus, allow students to add notes to their RQ #1 organizers as they read.

Teacher Work

Formative Assessment & One-on-One/Small-Group Conferences

Prioritize coaching students who can't yet determine the central idea of a text from key details. This is a fundamental skill for this Unit and for comprehending informational text. Begin your conferences with the following: *What is the topic of this text? What does it teach you about this topic? What is the central idea? What key details support this central idea?*

Then, continue to coach students as they research their topic (see "Coaching Moves: Unit 2 Research" at the beginning of this week for guidance).

Accountable Talk

Students discuss the following questions with a peer:

- What is a central idea of a text you read today? What key details support this central idea?
- What did you learn about your research topic? What questions do you still have?

Then, discuss as a class: *What is a central idea the whole class should hear?*

Continue to add to the class and student organizers, including the Word Map.

4. Exit Ticket

Select a text (or portion of text) that you read today. Write a paragraph to answer: *What is a central idea of this text? What details develop this central idea? Use academic and/or technical vocabulary as you write.*

5. Homework

Reading: Read for at least 30 minutes. Read Chapters 4–6 of *Trapped* by the end of the week. Log your reading in your ARC Reads Logbook.

Research: Find something in the news or from history that relates to Geology. Be ready to share an artifact from your research tomorrow.

Vocabulary: Make at least ten additions to your Word Map by the end of the week.

Example Central Ideas:

Pages 6–12 of *Earth's Core and Crust*.

Topic layers of the Earth

Example Central Ideas

- The four major layers of the Earth have distinct characteristics and impact one another.
- The Earth is made up of four layers that interact in different ways.

Grade 6, Unit 2: Geology

Informational Research Unit

How does the curriculum ensure all students can access grade-level standards and work?

ARC Fusion’s backwards design sets high expectations for students while providing multiple entry points for access. By honoring diverse interests and abilities, it offers various pathways for students to demonstrate mastery.

Texts



Grade-level informational texts build knowledge on Geology.

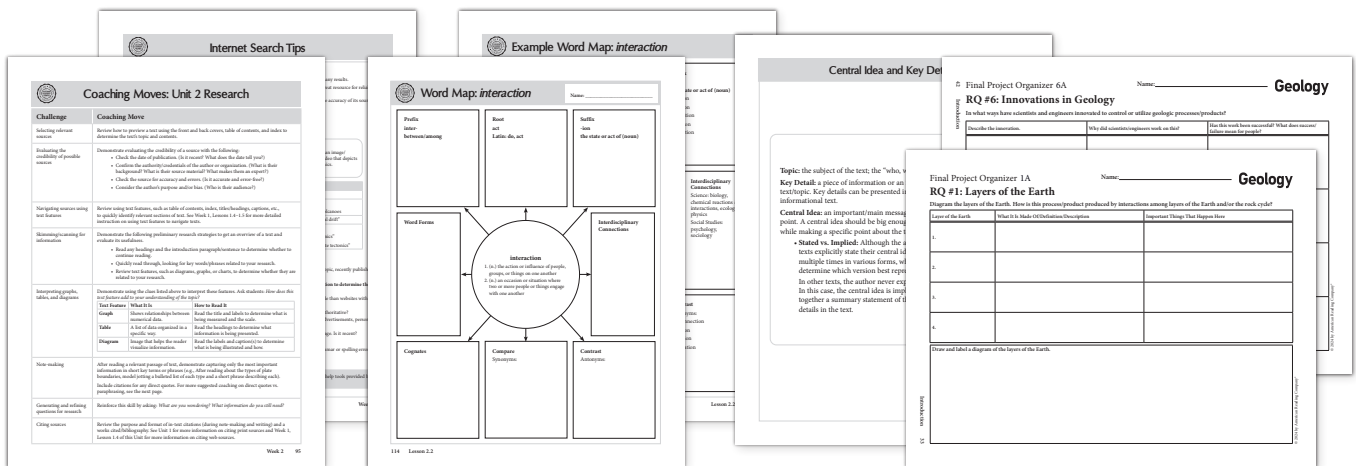


Strategically designed research libraries that allow students to further investigate the key concepts of Geology.



Additional small-group texts deepen knowledge and boost discussion, analysis, and student success.

Tools



Embedded teacher and student resources give every learner the support to access grade-level content.

Grade 6, Unit 2: Geology

Informational Research Unit

Grade 6 Rubric for a Proficient Informational Piece		Notes
Introduction	<input type="checkbox"/> States the main topic or subject matter <input type="checkbox"/> Makes the reader want to keep reading	
Central Idea	<input type="checkbox"/> Clearly stated or deliberately implied	
Supporting Ideas	<input type="checkbox"/> Organized into logical categories <input type="checkbox"/> Work together to answer the central idea <input type="checkbox"/> Organized in an order that makes sense for the central idea	
Details	<input type="checkbox"/> Facts, definitions, and/or other information and examples that are relevant to the central/supporting ideas <input type="checkbox"/> Sufficient <input type="checkbox"/> Properly cited from appropriate sources	
Organization: Organize my piece by:	<input type="checkbox"/> Using and maintaining a logical structure(s) that communicates my central idea (e.g., description, chronological/sequential order, cause/effect, problem/solution, compare/contrast)	
Formatting: Graphics: I use formatting graphics to:	<input type="checkbox"/> Develop my ideas and add to my text (e.g., diagrams, graphs, charts, photographs, illustrations) <input type="checkbox"/> Help the reader navigate the structure and development of ideas.	
Transitions	<input type="checkbox"/> Appropriate and varied <input type="checkbox"/> Clarify relationships among ideas and concepts	
Word Choice	<input type="checkbox"/> Precise and descriptive <input type="checkbox"/> Includes domain-specific vocabulary <input type="checkbox"/> Domain-specific vocabulary is used correctly and appropriately	
Formal Style, Syntax & Conventions: I use accurate syntax and proper conventions by:	<input type="checkbox"/> Maintaining a formal style throughout. <input type="checkbox"/> Writing sentences that are clear and complete (no run-ons or fragments) and of varied lengths and construction to create interest. <input type="checkbox"/> Using correct grammar, spelling, and punctuation.	
Conclusion	<input type="checkbox"/> Summarizes the information presented and conveys a sense of completeness	
	<input type="checkbox"/> /20 Total Points Earned	

Of Rocks

his **igneous, sedimentary** and develop gemstones. is rock is heated up under the earth, magma. Pressure forces the **magma** to ma hits Earth's surface, it starts to cool. It can, or harden as the Earth cools it, sly, and becomes a rock. Pumice is neous rocks.

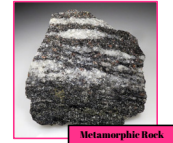
Gemstones

By: Camdyn Mueske



Sedimentary Rock

Metamorphic rocks are made when more and more layers of sediment pile on top of each other. Pretty soon, the layers on the bottom of the pile are forced deeper into Earth. As the bottom layers sink deeper into the planet, they are exposed to the intense heat of the earth's **mantle**, which is the layer nearest to the Earth's crust. The heat softens, breaks, and heats the rock. Water dissolves, and deposits remains of the rock's minerals into a new mixture. The solution is mixed together and baked in the earth's heat, which makes brand new metamorphic rocks. One gemstone, called gneiss, is made in metamorphic rocks.



Metamorphic Rock



Igneous Rock

When layers of weathered rock is being added to by other layers of rock by Richard and Louise Spillbury states, y rock forms as layers. The upper layers lower layers of rock until they become a type of sedimentary rock that is made s.

Impact On Society

Although gems are beautiful and very useful, the mining and use of gemstones affect both **society** and the **environment**. Humans depend on living things, such as animals for gemstones, and in return, animals are getting hurt, and the environment they live in are being damaged.

Gemstones affect our society, in ways you probably wouldn't have imagined to be possible. How could a shiny rock make such a social impact on Earth? According to an article by Christian Science Monitor, in Kimberley, South Africa, a mine was opened in the 1980s, and people raced off to the town in hopes of finding precious gemstones. In order to keep the mines going, black people were enslaved and forced to work. Despite their hard work, they were not receiving the pay they deserved. Some people couldn't even pay for food for their family, because of this unfair way of business. Black communities were said to be the largest reason why the mines in Kimberley were so successful. In 1960, Kimberley was segregated into white and black.



Diamond mine in Kimberley, South Africa

Gemstones not only affect society, but also affect the environment, causing a biological impact. Humans use calcite and hematite which is used for building. They also use gems in ultrasounds, grocery scanners, lasers, table salt, and many more. This has a biological impact, because, as humans we are considered a part of the **biosphere** which means we are living things. Gemstones affect humans by giving us many uses for them. Gems also affect animals. Within the past 50 years, 35 species of pearls have gone **extinct**. More than 60 other species of pearls are on the verge of extinction as well. The **ecosystem** is affected when too many pearls are harvested. With all organic and natural gems, the **environment** is at risk, and animal **habitats** are ruined.



Illegal mining in Madagascar, is ruining habitats, and is hurting lemurs in the area

Grade 7, Unit 2: American Revolution

Informational Research Unit

Why does this lesson matter when building knowledge?

Students use analysis of central ideas and supporting ideas/key details as support for comprehending complex texts about the timeline of the American Revolution.



Lesson 2.2

Lesson Plan

Lesson 2.2: Central Idea, Supporting Ideas, and Key Details

1. Do Now

Display the following task.

Share last night's research with a peer: How are your timelines similar or different? Focus on the following:

- **Timespan:** What is the difference between the first and last date on each timeline?
- **Scale/Intervals:** What do you notice about the scale/intervals on each timeline?
- **Events:** Which events do the timelines share? How much detail is included? Why? Briefly discuss as a class: Who learned something that the whole class should hear?

2. Central Idea, Supporting Ideas, and Key Details

Today, we will work on determining a central idea by identifying the supporting ideas and key details in a text. This will help you learn more from informational text and support your research with RQ #1 and this Unit.

Model/Guided Practice

Display and review "Central Idea, Supporting Ideas, and Key Details."

Display the "Central Idea & Supporting Ideas/Details" organizer. Distribute two blank copies to each student.

Work with students to skim and scan pages 37–45 of *History Smashers* and complete the organizer. See the example at the end of this lesson. Students add notes to their organizer.

- **Topic:** What is the section all about? Fill out the topic on the organizer.
- **Start with Supporting Ideas:** Notice how the author groups information into paragraphs. The main idea of each of these paragraphs/sections is usually a supporting idea. What are the supporting ideas? Fill them out on the organizer (e.g., *Hmm... the author seems to be covering three main events here: the Coercive Acts, the First Continental Congress, and preparations for war. I'm going to add a supporting idea for each of those. Tell a peer: What is the main thing the author wants you to know about the Coercive Acts...? Yes, that they were a punishment for the Boston Tea Party...).*
- **Key Details:** Which key details are most important in each paragraph/section? Why? Fill them out under each supporting idea on the organizer (e.g., *One of our supporting ideas is that the Coercive Acts were a punishment. I think the most important details are how they punished the colonies. I'm going to write...).*
- **Central Idea:** Use the supporting ideas and key details to determine. What is the author saying about the topic in this chapter? How do you know? Was it stated in the text or implied? Add a central idea to the organizer (e.g., *Tell a peer: Come up with one sentence that connects our three supporting ideas. This is our central idea. How about... "The Coercive Acts unified the colonists and pushed them to prepare for war." Let's look back—does the author say this explicitly? etc.).*
- **What did you like about the way the author communicated their topic, central idea, and key details? How might you imitate this in your own writing?**

Central Idea, Supporting Ideas, and Key Details continued on next page.

Learning Goals and Comprehensible Input

Don't just repeat the Unit's goals or say today's goal. Provide written support for key information or instructions you give to the students orally.

Suggested Lesson Pacing

Do Now: 5 minutes

Whole-Group Instruction: 20–25 minutes

Application: 15–25 minutes

Exit Ticket: 5 minutes

Coaching Focus

Students can use supporting ideas and key details in the text to determine a central idea.

You've Seen This Before: Central Idea & Key Details

Identifying the main idea and key details of a text is most likely a familiar concept from many years of informational text instruction. Pay attention to students' current proficiencies with this material and coach them toward success with increasingly sophisticated analysis of more complex texts.

Analyzing Central Idea(s)

Informational texts will likely include multiple central ideas. The entire text will have one or more central ideas, as will each chapter, section, and/or paragraph that supports the whole. Help students notice how these ideas work together to develop the author's main points. When students apply this skill in Application, they may identify a central idea for a chapter, a section, or an entire text, depending on what they read.

Vocabulary: Display/distribute the Word Map for "independence" and display the following task.

We have been learning about the events of the American Revolution & New Nation and America's road to independence from Great Britain. Let's study the word "independence."

Work with a peer to read and add to your Word Map for this week's word. You will continue adding to this Word Map over the next few days and turn it in at the end of the week.

Discuss briefly as a class and add to a class Word Map.

3. Application

Set Focus

Continue your research on RQ #1. Be on the lookout for anything you can add to your Word Map. Be ready to share a central idea and supporting ideas and/or details from a text you read today.

Student Work

Students read. If it does not disrupt their focus, allow students to add notes to their "Central & Supporting Ideas/Details" organizer and/or their RQ #1 organizers as they read.

Teacher Work

Formative Assessment & One-on-One/Small-Group Conferences

Begin your conferences by asking: *What is a central idea of this text? What supporting ideas and details develop this central idea? Prioritize coaching students who can't yet determine the central idea and supporting ideas/details. Help students decide whether to start with key details or supporting ideas, based on the text.* Then, continue to coach students as they research their topic (see "Coaching Moves: Unit 2 Research" at the beginning of this week for guidance).

Accountable Talk

Students discuss the following questions with a peer:

- *What is a central idea of a text you read today? What supporting ideas and/or key details develop this central idea?*
- *What did you learn about your research topic? What questions do you still have?*

Then, discuss as a class: *What is a central idea the whole class should hear?* Continue to add to the class and student organizers, including the Word Map.

4. Exit Ticket

Select a text (or portion of text) that you read today. Complete the "Central Idea and Supporting Ideas/Details" organizer for that section. Use academic and/or technical vocabulary as you write.

5. Homework

Reading: Read for at least 30 minutes. Read Chapter 3 of *History Smashers* by the end of the week. Log your reading in your ARC Reads Logbook.

Research: Find something in recent news (an article, video, image, etc.) related to the era or your topic. Be ready to share an artifact from your research tomorrow.

Vocabulary: Make at least ten additions to your Word Map by the end of the week.

Text Features and Supporting Ideas: Headings

Headings often provide a big clue to the supporting idea of a section of text. Coach students to use these text features as they determine supporting ideas.

Supporting Ideas in Texts Without Paragraphs/Sections

If students encounter a text in which the information is not grouped into clear sections/paragraphs, coach them to start with the key details.

- Start by determining the key details from the selection.

- Can the key details be organized into groups that make sense? List all the key details, organize them into categories that make sense, then name these categories.
- This title/label for each of these groups is likely a supporting idea.

"Central Idea & Supporting Ideas/Details" Organizer as a Scaffold

This organizer serves as a frame for supporting students as they determine a central idea, supporting ideas, and key details. As students continue to use this organizer, they will begin to map this way of thinking and will not need to rely on an organizer to think about and discuss the author's central idea/supporting ideas/details.

Grade 7, Unit 2: American Revolution

Informational Research Unit

How does the curriculum ensure all students can access grade-level standards and work?

ARC Fusion’s backwards design sets high expectations for students while providing multiple entry points for access. By honoring diverse interests and abilities, it offers various pathways for students to demonstrate mastery.

Texts



Grade-level informational texts build knowledge on the American Revolution.



Strategically designed research libraries that allow students to further investigate the timeline of the American Revolution.



Additional small-group texts deepen knowledge and boost discussion, analysis, and student success.

Tools

Central Idea, Supporting Ideas, and Key Details

Sample Outline: First Continental Congress

Introduction	Body Paragraphs	Conclusion
Topic: First Continental Congress Context: The First Continental Congress was a turning point in the road to American independence, because it was the first time the colonies were unified.	Key Details: • Great Meeting at the Boston Tea Party, Unanimous Act • During Declaration and Resolves, Articles of Association, petition to King George • After: 2nd Cont. Congress	emphasize point that this was the first time all the colonies worked together - first time they were "united" in becoming "United States"

Word Map: independence

Prefix	Root	Suffix
in-, un-, opposite of, inoperative, inappropriate, incontinent, incoherent, inured	in-, -less, -off, -less, -worthy(-ed), -able, -ible, -tion, -sion, -sive, -sive(-ly), -ous, -ous(-ly), -ous(-ness), -ous(-ness), -ous(-ness), -ous(-ness)	-able, -ible, -ness, -sion, -sive, -sive(-ly), -ous, -ous(-ly), -ous(-ness), -ous(-ness)

Final Project Organizer 5

RQ #5: Legacy

What is the legacy of this event for the New Nation and today?

Embedded teacher and student resources give every learner the support to access grade-level content.

Grade 7, Unit 2: American Revolution

Informational Research Unit

The First Continental Congress

Independence or reconciliation? Fight or negotiate? Strike quickly or strategize? These were some of the questions up for debate at the First Continental Congress. British Parliament had just passed the Intolerable Acts, hoping to crush rebellion in the American colonies once and for all. Instead, the colonies rallied together and quickly organized the First Continental Congress. This event was a turning point in the road to American independence and the beginning of American democracy.

From Individual Rebellions to One Revolution

The First Continental Congress was a turning point in the road to American independence because it was the first time the colonies overcame their differences to find common ground. Before this, each colony was an individual part of the British Empire. They had their own separate governments, their own money, and their own beliefs. They even fought each other, like the 60-year skirmish between New York and New Jersey over borders. The one thing they all had in common was their relationship with Great Britain (Brennan).

By September 1774, conflict had been happening between Great Britain and the American colonies for a long time. Great Britain won the French and Indian War (1754–63), but it cost them a lot of money. Since the war had been fought in the colonies, to protect the colonists, Great Britain expected the colonists to help pay. Over the next ten years, British Parliament passed many laws to raise taxes on everyday things in the colonies, like sugar, molasses, stamps and other papers, and tea (Messner 191). Colonists protested in a variety of ways. Unsurprisingly, they didn't always agree on their methods. According to the Museum of the American Revolution, colonists "pioneered new forms of protest and debated what kinds of protests were legitimate. They questioned not just what people were protesting but also who was protesting and how they went about it" ("Protest in Early America Discovery Cart"). They wrote pamphlets, boycotted, looted British ships, petitioned the king, and joined political organizations.

In the colony of Massachusetts, the Sons of Liberty were one of the more radical patriot organizations. They often used threats and violence against the British. On December 16, 1773, they boarded British ships and tossed 342 chests of tea into Boston Harbor. If you thought this would bring the colonies together, guess again. Colonists were divided in their opinions on the "Boston Tea Party." While the Sons of Liberty got some support, many colonists thought they were wrong. Benjamin Franklin thought the group should pay for the tea they had damaged. George Washington believed the Sons of Liberty had overstepped ("The Boston Tea Party").

So what could possibly unite so many different voices and opinions against the British? In 1774, British Parliament passed the Intolerable Acts to punish the colonies for the Boston Tea Party. These laws closed Boston Harbor and made it illegal for the colonists to gather in large groups. But, perhaps worst of all, they revoked the Massachusetts colony charter. Colonists were no longer guaranteed the same rights as English citizens (Messner 38–39). British Parliament had finally messed with the one thing the colonies shared — their British identity. It was time to unite.

A Case for (Some) Independence

On September 5, 1774, the delegates of the First Continental Congress came together to figure out what to do about the Intolerable Acts. Many of the delegates were hesitant to work together. The threat of treason hung over them (Blumrosen and Blumrosen). At first, the delegates disagreed about almost everything, but they managed to find common ground on a series of issues.

One issue was the rights of colonists. Many delegates believed that they couldn't just protest — they had to tell Parliament how to treat the colonies. They created the Declaration and Resolves to establish the rights of colonists. The Declaration claimed colonists are "entitled to life, liberty, and property" ("Declaration and Resolves of the First Continental Congress"). They also claimed the right to be represented in government, to a fair trial, and to peacefully assemble.

Another issue was trade: Who had the right to regulate it in the colonies? This was really a question of how much power Great Britain had over the colonies. The delegates believed Great Britain was tyrannical. They wanted the colonies to have control over their own resources. They created another document called the Articles of Association that announced a boycott of British goods, including a ban on the slave trade. This ban on the slave trade was most likely economic, not moral. It did not abolish enslavement in the colonies. In fact, at the same time, delegates from South Carolina were making sure they would continue to make money from enslavement. They successfully argued that rice, which was produced by enslaved people, should continue to be exported to Europe (McBurney). The Articles went even further than a boycott — they laid out a plan to "promote agriculture, arts and the manufactures of this country, especially that of wool" ("Journals of the Continental Congress – The Articles of Association; October 20, 1774"). The colonies would grow more food and create more goods themselves — in other words, economic independence from Great Britain.

Full independence, on the other hand, was more complicated. At the time, most people believed that colonists should avoid a war and attempt to negotiate ("Continental Congress, 1774–1781"). Of course, not everyone agreed. John Adams, a delegate from Massachusetts (and future U.S. President), believed independence was the "only course" and that "war was unavoidable if freedom was to be secured" ("The Continental Congress"). As it turns out, he was right, but the colonies wouldn't declare independence until July 1776.

Liberty and Justice . . . For All?

The First Continental Congress was the beginning of American democracy because it laid the foundation for the new American government.

Like in the First Continental Congress, the issue of power and control was central to the New Nation. After fighting a tyrannical king and Parliament, colonists worried about a powerful central government. The Articles of Confederation were passed in 1777 and gave most power to the states. The central government couldn't raise taxes, regulate trade, or form an army. States

Grade 7 Rubric for a Proficient Informational Piece	Notes
Introduction /2 <input type="checkbox"/> States the main topic or subject matter and previews the information to follow <input type="checkbox"/> Makes the reader want to keep reading	
Central Ideas /4 <input type="checkbox"/> Clearly stated or deliberately implied	
Supporting Ideas /6 <input type="checkbox"/> Organized into logical categories <input type="checkbox"/> Work together to convey the central idea <input type="checkbox"/> Organized in an order that makes sense for the central idea	
Details /6 <input type="checkbox"/> Facts, definitions and/or other information and examples that are relevant to the central/supporting ideas <input type="checkbox"/> Sufficient <input type="checkbox"/> Properly cited from appropriate sources	
Organization I organize my piece by: /1 <input type="checkbox"/> Using and maintaining a logical structure(s) that communicates my central idea (e.g., descriptions, chronological/sequential order, cause/effect, problem/solution, compare/contrast).	
Formatting/Graphics I use formatting/graphics to: /2 <input type="checkbox"/> Develop my ideas and add to my text (e.g., diagrams, graphs, charts, photographs, illustrations). <input type="checkbox"/> Help the reader navigate the structure and development of ideas.	
Transitions /1 <input type="checkbox"/> Appropriate and varied <input type="checkbox"/> Clarify relationships among ideas and concepts	
Word Choice /3 <input type="checkbox"/> Precise and descriptive <input type="checkbox"/> Includes domain-specific vocabulary <input type="checkbox"/> Domain-specific vocabulary is used correctly and appropriately	
Formal Style, Syntax & Conventions I use accurate syntax and proper conventions by: /3 <input type="checkbox"/> Maintaining a formal style throughout. <input type="checkbox"/> Writing sentences that are clear and complete (no run-ons or fragments) and of varied lengths and construction to meet interests. <input type="checkbox"/> Using correct grammar, spelling, and punctuation.	
Conclusion /2 <input type="checkbox"/> Summarizes the information presented and conveys a sense of completeness	
Total Points Earned /30	

even put taxes on goods from other states (Perritano 13). In 1787, the Constitutional Convention replaced the Articles of Confederation with the Constitution we have today. The main debate at the Convention was how strong the central government should be compared to the states. Ultimately, the founders created the three branches of government and the system of "checks and balances" that keeps one branch from becoming too powerful (Kaul 28–29).

The delegates at the Continental Congress were worried about colonists' rights — now that the Constitution was written, what would protect Americans' rights? The Bill of Rights was ratified in 1791 and includes many of the same rights from the Declarations and Resolves. For example, the First Amendment says the following:

Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech, or of the press; or the right of the people peaceably to assemble, and to petition the Government for a redress of grievances (Kaul 35).

In other words, just like the delegates at the Continental Congress wanted, Americans have the right to peaceful assembly and to complain to their government.

What you won't see in the Constitution or the Bill of Rights is the ban on the slave trade from the Articles of Association. Why? Many people believed it was hypocritical for a new country that had just fought for independence to take away other people's independence. But the Southern States' entire economies — or the representatives' entire fortunes — depended on slave labor. They would not have joined the U.S. unless slavery stayed legal. This compromise is possibly the most notorious example of a moral compromise made in the name of maintaining unity in all of U.S. history.

At the First Continental Congress, delegate Patrick Henry declared, "The distinctions between Virginians, Pennsylvanians, New Yorkers, and New Englanders are no more. I am not a Virginian but an American" (Brennan). The First Continental Congress united the colonies and created a road map for American democracy, good and bad — one we still navigate today.

Works Consulted

"1774 Articles of Association." National Archives Foundation. <https://www.archivesfoundation.org/documents/1774-articles-of-association/>. 28 August 2024.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

"The Boston Tea Party." *American Battlefield Trust*. 10 June 2024. <https://www.battlefields.org/learn/articles/boston-tea-party>. 10 September 2024.

Brennan, Kelly M. "What Similarities and Differences Did the 13 Colonies Share?" *Colonial Williamsburg*. 11 May 2021. <https://www.colonialwilliamsburg.org/learn/deep-dives/13-colonies-similarities-and-differences/>. 11 September 2024.

"Continental Congress." *American Experience*. <https://www.pbs.org/video/americanexperiencefeatures/admscontinental-congress/august-2024>.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

"Declaration and Resolves of the First Continental Congress." *American Battlefield Trust*. <https://www.battlefields.org/learn/primary-sources/declaration-and-resolves-first-continental-congress>. August 2024.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

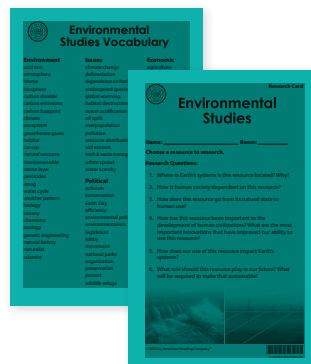
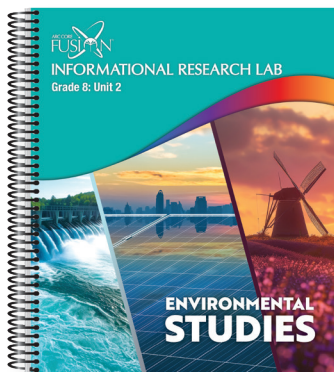
Blumrosen, Alfred, and Ruth Blumrosen. *Slave Nation: How Whites United the Colonies & Sparked the American Revolution*. Sourcebooks, 2006.

Grade 8, Unit 2: Environmental Studies

Informational Research Unit

Why does this lesson matter when building knowledge?

Students use analysis of central ideas and supporting ideas/key details as support for comprehending complex texts about Earth’s systems and resource dependence.



Lesson 2.2

Lesson Plan

Lesson 2.2: Central Idea, Supporting Ideas, and Key Details

1. Do Now

Display the following task.

Share last night’s research with a peer: What did you learn about the Earth’s systems? About your topic? Add new information to your organizers.

Briefly discuss as a class: Who learned something about the Earth’s systems or your topic that the whole class should hear?

2. Central Ideas, Supporting Ideas, and Key Details

Today, we will work on determining a central idea and analyze how it is developed by supporting ideas and key details. This will help you learn more from informational text and support your research with RQ #1 and this Unit.

Read/Write/Discuss Complex Text

Display and review “Central Idea, Supporting Ideas and Key Details.”

Display the “Central Idea & Supporting Ideas/Details” organizer. Distribute two blank copies to each student.

Students reread pages 29–35 of *The Story of More* (starting at “Every plant on Earth...” and ending at the section break). Use the questions in the right-hand column during reading to support comprehension of complex text. After reading, work with students to determine the central idea, supporting ideas, and details, and to complete the organizer (see the end of this lesson for a sample organizer).

- **Topic:** This passage is all about...
- **Start with Supporting Ideas:** Notice how the author groups information into paragraphs. The main idea of each of these paragraphs/sections is usually a supporting idea. What are the supporting ideas? Fill them out on the organizer.
- **Key Details:** Which key details are most important in each paragraph/section? Why? Fill them out under each supporting idea on the organizer.
- **Central Idea:** Use the supporting ideas and key details to determine: What is the author saying about the topic in this chapter? How do you know? Was it stated in the text or implied? Add a central idea to the organizer.
- What did you like about the way the author communicated their topic, central idea, and key details? How might you imitate this in your own writing?

After reading, discuss as a class: How does this section confirm, contradict, or extend what you know about the Earth’s systems? Students add notes to their FPOs for RQ #1.

Central Idea, Supporting Ideas, and Key Details continued on next page.

Suggested Lesson Pacing

Do Now: 5 minutes
Whole-Group Instruction: 20–25 minutes
Application: 15–25 minutes
Exit Ticket: 5 minutes

Coaching Focus

Students can use supporting ideas and key details in the text to determine a central idea.

You’ve Seen This Before: Central Idea, Supporting Ideas, and Key Details

Identifying the central idea, supporting ideas, and details of a text is most likely a familiar concept from many years of informational text instruction. Pay attention to students’ current proficiencies with this material and coach them toward success with increasingly sophisticated analysis of more complex texts.

Key Science Concepts & Vocabulary

Discuss the following questions, using evidence from the text to scaffold comprehension and analysis.

Page 29

- Paragraph 1
 - What does “**degraded**” mean? How do you know?
 - How do plants get water and nutrients?
- Par. 2: What makes different ecosystems unique?

Page 30

- Par. 1: Why does Jareen call farm fields “artificial landscapes”? How have they changed in the last 50 years?
- Par. 2: What does “**lavishly**” mean? How do you know?

Text-specific questions continue on next page.



Learning Goals and Comprehensible Input

Don’t just repeat the Unit’s goals or say today’s goal. Provide written support for key information or instructions you give to the students orally.

Vocabulary: Display/distribute the Word Map for “consumer” and display the following task.

Scientists continue to explore ways to deliver more food to the consumer. Let’s study the word “consumer.”

Work with a peer to read and add to your Word Map for this week’s word. You will continue adding to this Word Map over the next few days and turn it in at the end of the week.

Discuss briefly as a class and add to a class Word Map.

3. Application

Set Focus

Continue your research on RQ #1. Be on the lookout for anything you can add to your Word Map. Be ready to share a central idea and supporting ideas and/or details from a text you read today.

Student Work

Students read. If it does not disrupt their focus, allow students to add notes to their RQ #1 organizers as they read.

Teacher Work

Formative Assessment & One-on-One/Small-Group Conferences

Prioritize coaching students who can’t yet determine the central idea of a text from key details. This is a fundamental skill for this Unit and for comprehending informational text. Begin your conferences with the following: What is the central idea? What supporting ideas and details develop this central idea?

Then, continue to coach students as they research their topic (see “Coaching Moves: Unit 2 Research” at the beginning of this week for guidance).

Accountable Talk

Students discuss the following questions with a peer:

- What is a central idea of a text you read today? What supporting ideas and/or key details develop this central idea?
- What did you learn about your research topic? What questions do you still have?

Then, discuss as a class: What is a central idea the whole class should hear?

Continue to add to the class and student organizers, including the Word Map.

Lesson continued on next page.

Key Science Concepts & Vocabulary (continued)

Page 30 (continued)

- Par. 3
 - Why does Jareen call farm fields “artificial real estate”?
 - What are pesticides?

Page 31

- Par. 1: What does “**oblivious**” mean? How do you know? (Repeat for “oblivious”.)
- Par. 3: What does “**edible**” mean? How do you know? (Repeat for “edible.”)

Page 32

- Par. 1: What is “**domestication**”? Why is it important?
- Par. 2
 - Who is Gregor Mendel? What is he famous for?
 - What does “**hybrid**” mean? How do you know?
- How did scientists genetically modify plants in the 1990s? What was the result?

Page 33

- Par. 2: What are genes? How are genes and proteins related?

Page 34

- Par. 1
 - What does Jareen mean by “desirable qualities”? How do you know?
 - How do scientists breed new crops?
- Par. 2
 - What is molecular genetics? Why does it matter?
 - What does “**recombinant**” mean? How do you know?

Page 35

- Par. 1: What are GMOs? How are they different from non-GMO plants?
- Par. 3: What does “**conventional**” mean? How do you know?

Grade 8, Unit 2: Environmental Studies

Informational Research Unit

How does the curriculum ensure all students can access grade-level standards and work?

ARC Fusion’s backwards design sets high expectations for students while providing multiple entry points for access. By honoring diverse interests and abilities, it offers various pathways for students to demonstrate mastery.

Texts



Grade-level informational texts build knowledge on Environmental Studies.

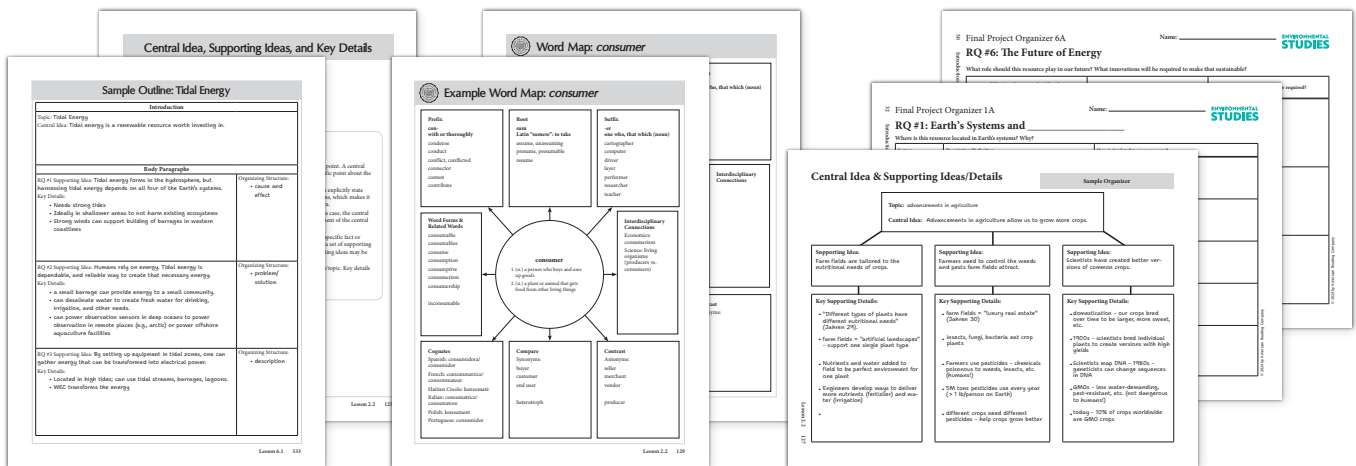


Strategically designed research libraries that allow students to further investigate Environmental Studies.



Additional small-group texts deepen knowledge and boost discussion, analysis, and student success.

Tools



Embedded teacher and student resources give every learner the support to access grade-level content.

Grade 8, Unit 2: Environmental Studies

Informational Research Unit

Sample Final Draft: Tidal Energy

A Rising Tide: The Growth of Tidal Energy

Just one person uses an average of 20.11 kWh (Kilowatt-hours) of electricity a day in the United States ("How Many kWh Per Day Is Normal?"). That's about as much energy as it would take to run a dishwasher 10 times. Most of that electricity comes from nonrenewable, environmentally damaging fossil fuels. As we look to our future, we need to find renewable, Earth-friendly resources to supply our tremendous needs. Tidal energy is one form of renewable energy that harnesses the power of something we have in plenty: water.

What Is Tidal Energy?

Tidal energy converts energy from the rise and fall of the tides into a useable form of power. The rush of water as the tide comes in or goes out turns machinery that transforms that movement into electricity. Tidal energy is a renewable and highly reliable form of energy. Tides are easy to predict, don't have a lot of variation, and are minimally impacted by weather (La). It's estimated that in 2020, tidal energy technology produced 500 gigawatts (GW) of energy. That's equal to one-fourth of the energy supplied by coal (La). Tidal energy produces more power in less space than either wind or solar energy. However, there are some disadvantages. Tidal energy power plants can be expensive to build and maintain and can only operate along coastlines.

Humans have been harnessing the power of tides for a long time. As far back as the 700s CE, tide mills were used to power machinery (Smoot). Tide mills were dams or walls built to hold water at high tide. When the tide went down, water funneled into a sluice, or narrow channel, to turn a water wheel. The water wheel would then turn machinery, like millstones (Dickmann 10). Then, in 1910, a French engineer invented the oscillating water column (OWC). This is a vertical chamber drilled into a cliff. As the tides came in and the water level rose, air would push out of the top through a turbine, generating energy. The first OWCs, called "whistling buoys," were off the coast of the United States. As the air was pushed out of the top, the OWCs whistled, warning sailors that the coast was nearby (Dickmann 15).

In 1966, the first tidal power plant was built in Northern France on the estuary of Rance River. It was a huge success. The turbines there generated 240 megawatts (MW) of electricity. That's enough energy to power 4–6 million light bulbs. A few decades after that, in 1984, the first tidal plant was built in North America. The Annapolis Tidal Power Plant was built in the Bay of Fundy in Nova Scotia, Canada, because of the high tidal range. It operated for 34 years and generated enough power for 4,500 homes. In 2003, the world's largest facility for testing and demonstrating wave and tidal technology was built in the UK. The European Marine Energy Centre has facilitated the testing of more tidal energy devices than anywhere else worldwide ("Tidal Energy," *Pacific Northwest National Laboratory*).

Since then, more tidal power stations have been built around the world, including the first tidal turbine system in Ireland and the Sihwa Lake Tidal Power Station in South Korea, which is now the largest operating tidal power plant in the world, with a capacity of 254 MW. This will soon change. In 2018, the MeyGen energy project, to build a tidal stream array in the Pentland Firth of Scotland, began. In 2020, it generated and delivered more than 35 GW of power to the grid. When finished, 61 turbines will generate a projected 400 MW of energy ("Tidal Energy," *Pacific Northwest National Laboratory*).

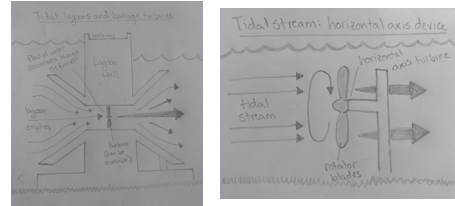
Harnessing the Power of the Tides

How do these power plants harness tidal energy? Currently, there are three methods engineers have developed. The most common way tides are harnessed is through a barrage, a large dam-like structure. Gates in the dam open as the tide rises, then close to create a pool. That water is released through turbines: machines that capture energy through rotation. Water, air, or steam turns the turbine, which produces energy ("Turbine"). The release of water through the barrage's turbines creates a controlled rate of energy. Once that energy is harvested,

a wave energy converter (WEC) transforms the energy into electrical power. Barrages can be expensive to build and maintain ("Tidal Energy," *National Geographic*).

Another way that tidal energy is harnessed is through tidal streams. In tidal stream technology, a turbine is placed within an inlet, strait, or other narrow channel of water. As water moves through the stream, it moves through the turbine to produce energy. This energy goes into a WEC to be transformed into electricity. This type of tidal energy technology can be complex because the turbines are large. They need to be placed in shallow water and somewhere ships can navigate around them. However, tidal stream technology is also less expensive than a barrage because it only needs one turbine ("Tidal Energy," *National Geographic*).

Finally, tidal energy can be harnessed from a tidal lagoon. This is an enclosed body of ocean water similar to the one created by a barrage. Tidal lagoons can form naturally, along the coastline or in estuaries, or by a man-made rock wall. A power plant on a tidal lagoon would function similarly to a barrage. Unlike a barrage, the power is continuous, as the lagoon naturally fills and empties with the tidal cycle. However, the energy output of tidal lagoons is not as high, and it is costly, so it has yet to be utilized ("Tidal Energy," *National Geographic*).



Impacts of Tidal Energy

Tidal energy is a clean and sustainable source of energy with many environmental and social benefits. Tidal energy systems can increase the amount of silt in lagoons, which can be beneficial for certain marine species. For example, in the Rance river, where the first tidal energy power plant was built, cutfish now thrive with higher silt levels in the waters. Tidal lagoons can also provide protection to smaller species, since larger predators like sharks cannot fit through the barriers ("Tidal Energy," *National Geographic*). Evidence suggests that the construction of Sihwa Lake Tidal Power Station in South Korea has improved the water quality and created a mud flat that provides shelter for various marine animals (La).

Tidal energy also has social benefits. Some of the systems that harness tidal energy, like barrages, have the ability to desalinate, or remove the salt from, ocean water. This water can then be used for drinking, irrigation, and other needs ("Tidal Energy," *Pacific Northwest National Laboratory*). Aquaculture, or fish farming, has traditionally relied on fossil fuels for power (Garavelli, et al.). Co-location with tidal power plants — building fish farms and tidal generators near each other — could help reduce carbon emissions and make aquaculture more sustainable ("Marine Energy for Aquaculture"). Finally, research is being done into ways tidal energy can be used in areas not conducive to people, such as the Arctic and the deep ocean. Could tidal energy power observation sensors? Or provide energy for autonomous vehicles to collect samples on the ocean floor? Both of these applications would support research while keeping researchers safe.

While tidal energy is a great solution for sustainable, renewable energy, it is not without its flaws. One major flaw is the environmental impact on ocean habitats. Turbines can be dangerous to marine animals. Tidal energy machinery and equipment can be loud, disturbing communication and navigation for animals

1 Sample Final Draft: Tidal Energy

Sample Final Draft: Tidal Energy 2

322 Week 6

Week 6 323

802
150

Grade 8 Rubric for a Proficient Informational Piece		Notes
Introduction		
./2	States the main topic or subject matter and previews the information to follow	
./1	Makes the reader want to keep reading	
Central Ideas		
./4	Clearly stated or deliberately implied	
Supporting Ideas		
./6	Organized into logical categories	
./5	Work together to convey the central idea	
./4	Organized in an order that makes sense for the central idea	
Details		
./6	Well-chosen facts, definitions and/or information and examples that are relevant to the central supporting ideas	
./5	Sufficient	
./4	Properly cited from appropriate sources	
Organization		
./1	Using and maintaining a logical structure(s) that communicates the central idea (e.g., description, chronological/sequential order, cause/effect, problem/solution, compare/contrast)	
Formating/Graphical		
./2	Developing an idea and add to it text (e.g., diagrams, graphs, charts, photographs, illustrations)	
./1	Help the reader navigate the structure and development of ideas	
Transitions		
./1	Appropriate and varied	
./0	Create cohesion and clarify relationships among ideas and concepts	
Word Choice		
./3	Precise and descriptive	
./2	Includes domain-specific vocabulary	
./1	Domain-specific vocabulary is used correctly and appropriately	
Formal Style		
./3	Maintaining a formal style throughout	
./2	Writing sentences that are clear and complete (no run-ons or fragments) and of varied lengths and connections to create interest	
./1	Using correct grammar, spelling, and punctuation	
Conclusion		
./2	Summarizes the information presented and conveys a sense of completeness	
./0	Total Points Earned	

like dolphins or whales. Increasing and decreasing water levels can lower the salinity levels of lagoons, which can disrupt ecosystems. The Annapolis Tidal Generating Station was forced due to its environmental impact that the Canadian Science Advisory Secretariat discovered the substantial rate of fish mortality, or death. An astonishing one-quarter of the fish passing through the tidal plant were killed. In one instance, a humpback whale swam through an open sluice gate and was trapped for several days (Annapolis Tidal Station).

The Future of Tidal Energy

Worldwide, countries are investing in developing new tidal technology and building new tidal power plants. Engineers are working to improve efficiency of tidal generation, decrease environmental impacts, and make tidal technology profitable for companies ("Tidal Energy," *Pacific Northwest National Laboratory*). One innovation in tidal technology is utilizing microhydropower. In other words, diverting smaller waterways like rivers into small turbines. While microhydropower won't produce huge amounts of energy, it can provide energy to smaller communities. One such community already utilizing microhydropower is the King Cove community of Alaska, with 700 residents (Friedl 43). This technology provides self-sufficiency to the King Cove community and, if used in other smaller communities globally, can have a large positive environmental impact. Another innovation overlaps with wave energy technology: floating tidal power plants make use of Azura devices — small machines that merge up and down with the waves to generate energy. This can supply enough energy to provide electricity to small islands, such as those found in Hawaii (Dickmann 27). These plants can also be located in shallow waters, which causes less environmental impact.

Some innovators are thinking on a larger scale. Scientists and engineers have been hypothesizing about creating DTP, dynamic tidal power. This would involve huge dams as long as 31 miles long, extending from seabeds into open ocean ("Tidal Energy," *National Geographic*). DTP has enormous potential, since it would be used on an open coast where tidal range does not need to be high and, thus, could harness tidal energy in many locations globally ("Dynamic Tidal Power").

At the Pacific Northwest National Laboratory, researchers are studying different ways to assess different types of turbines based on that environmental impact on water quality and fish migration. The researchers running these studies hope to "inform site selection for tidal energy generation installations, assist with estimating resource requirements for tidal energy projects, inform technology advancement, and support international standards development" ("Tidal Energy," *Pacific Northwest National Laboratory*). In other words, they hope to make it easier to invest in tidal energy by helping developers make informed decisions.

Tidal plant projects are in development across the globe. In Wales, 13 square miles of turbines are being planned on the sea floor. When complete, this will be the largest tidal stream generator in the world. It is expected to power 180,000 homes ("Tidal Energy," *Advantages, Disadvantages, and Future Trends*). Power plants are also in development in Scotland, France, Japan, Korea, China, Canada, and the United States ("Tidal Energy," *Pacific Northwest National Laboratory*).

Human consumption of energy is only increasing with time. Energy demand necessitates creating options for harnessing energy that is dependable and sustainable. Nonrenewable resources, while often cheap, are not going to last forever. While tidal energy is not yet widely used, it has a lot of potential. It's a large investment, but what better to invest in than the future of our planet? Using a resource that is available to us in plenty is not only smart but also necessary.

3 Sample Final Draft: Tidal Energy

Works Consulted

La, Charle. "Tidal Energy: Advantages, Disadvantages, and Future Trends." *Earth*. 9 August 2022. <https://earth.usf.edu/in-tidal-energy/>. Accessed 2 September 2024.

"Tidal Energy for Aquaculture." *Pacific Northwest National Laboratory*. <https://www.pnnl.gov/projects/marine-energy/aquaculture>. Accessed 1 October 2024.

Michael, Fred. *Power Up! Energy from Wind, Sun, and Tides*. Cherry Lake Publishing, 2015.

Smoot, Grant. "The History of Tidal Energy: The Big Picture." *Impulse Energy*. 2015. <https://impulseth.com/the-history-of-tidal-energy/>. Accessed 17 September 2024.

"The Blue Economy: Advancing the power of the ocean." *Pacific Northwest National Laboratory*. <https://www.pnnl.gov/blue-economy/>. Accessed 6 September 2024.

"Tidal Energy." *National Geographic*. National Geographic Society. 19 October 2023. <https://www.nationalgeographic.com/science/tidal-energy/>. Accessed 6 September 2024.

U.S.A.C. et al. "Dynamic Tidal Power." <https://www.pnnl.gov/research/dynamic-tidal-power/>. Accessed 1 October 2024.

U.S.A.C. et al. "Turbine" *EnergyTechnology*. <https://energytechnology.com/en/energytechnology/>. Accessed 1 October 2024.

U.S.A.C. et al. "Turbine" *EnergyTechnology*. <https://energytechnology.com/en/energytechnology/>. Accessed 1 October 2024.

U.S.A.C. et al. "Feasibility Assessment for Co-locating and Powering Offshore Aquaculture with the Energy from the United States Ocean and Coastal Management, vol. 221, 2022. ScienceDirect. <https://doi.org/10.1016/j.oceaman.2022.106282>. Accessed 1 October 2024.

Many kWh Per Day Is Normal? *Leena Aristo*. <https://leenaaristo.com/how-many-kwh-per-day-is-normal-average-home-electricity-consumption/>. Accessed 1 September 2024.

Tracy, Tony. *The Science of Our Changing Planet*. UK Publishing, 2024.

Sample Final Draft: Tidal Energy 4

Week 6 325