



**Bluebonnet
Learning**
K-5 Reading Language Arts

ENGLISH

INNOVATION AND INDUSTRY IN ENERGY



GRADE 4 UNIT 9 | ACTIVITY BOOK

EDITION 1

Grade 4

Unit 9

Innovation and Industry in Energy

Activity Book

Acknowledgement:

Thank you to all the Texas educators and stakeholders who supported the review process and provided feedback. These materials are the result of the work of numerous individuals, and we are deeply grateful for their contributions.

Notice: These learning resources have been built for Texas students, aligned to the Texas Essential Knowledge and Skills, and are made available pursuant to Chapter 31, Subchapter B-1 of the Texas Education Code.

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openeducationresources@tea.texas.gov.

Unit 9

Innovation and Industry in Energy

Activity Book

This Activity Book contains activity pages that accompany many of the lessons from the Teacher Guide for Unit 9. The activity pages are organized and numbered according to the lesson number and the order in which they are used within the lesson. For example, if there are two activity pages for Lesson 4, the first will be numbered 4.1, and the second 4.2. The activity pages in this book do not always include written instructions for students because the instructions would have words that are not decodable. Teachers will explain these activity pages to the students orally, using the instructions in the Teacher Guide. The Activity Book is a student component, which means each student should have an Activity Book.

NAME: _____
DATE: _____

Modern Energy Sources Make Life Easier

Directions: Think about the machines and inventions that use energy every day to make your life easier. List as many as you can in the chart below. Use the examples to get you started.

Communication	Products	Daily Living	Transportation
<i>telephone</i>	<i>dishwasher</i>	<i>stove</i>	<i>trains</i>
Other			

NAME: _____

DATE: _____

1.2

Activity Page

Vocabulary

oil, n. a slippery liquid made from petroleum and used for fuel

fuel, n. a substance that can be burned as a source of energy

fuel, v. to supply power or energy

Example: fuel an argument

energy, n. the ability to do work or cause change

Directions: Connect the sentence on the left to the definition on the right that matches the way the word is being used.

The mechanic added oil to the car's engine.	• fuel, v. to supply power or energy Example: fuel an argument
Make sure we have enough fuel in the tank before the big trip.	• fuel, n. a substance that can be burned as a source of energy
My first goal fueled my victory.	• oil, n. a slippery liquid made from petroleum and used for fuel
The battery was too low on energy to turn on the toy.	• energy, n. the ability to do work or cause change

NAME: _____

DATE: _____

1.3

Activity Page

“The Story of Oil”

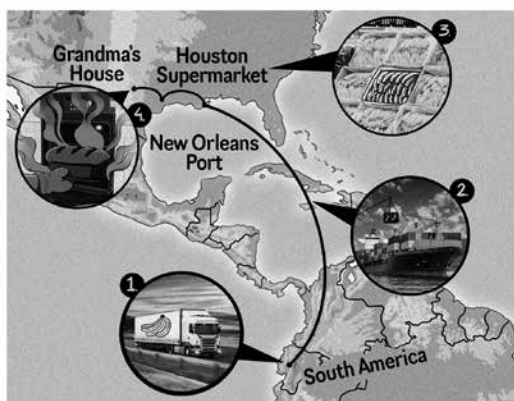


Banana Shopping

Suppose you and your grandmother get on the bus, and you go to the supermarket. All kinds of fruits are on sale there, including bananas. You pick up a bunch, along with flour, butter, and eggs. Then you take the bus home, and you make your banana bread.

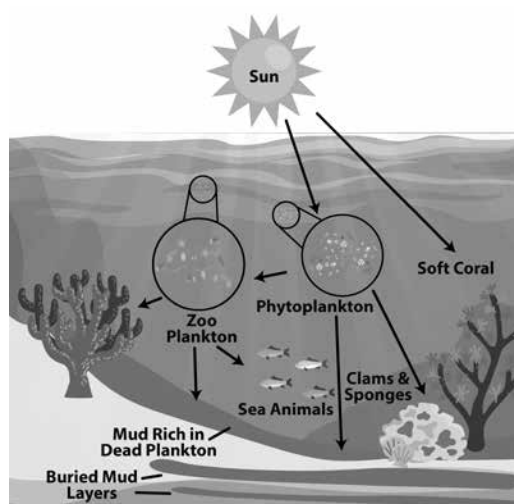
Banana Travels

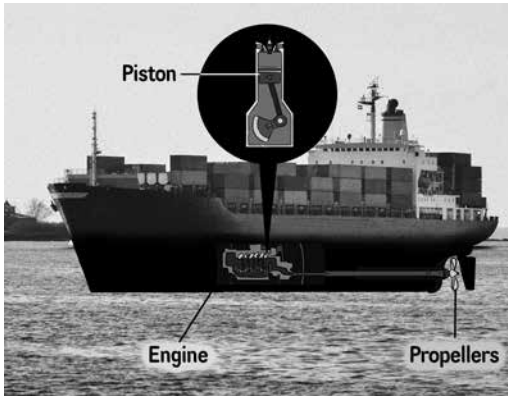
What does baking banana bread have to do with the story of **oil**? Well, have you ever asked yourself where bananas come from? In much of the United States, the answer is: somewhere else! We grow a few bananas in the United States, but most of them come to us from Asia and South America.



The Formation of Oil

Have you ever stopped to think about how the food we eat is grown? In order for bananas to grow, they must go through a process called photosynthesis. Photosynthesis is the process of using energy from sunlight to create food. All plants, algae, and some microorganisms require this process to live and grow. Photosynthetic organisms live on land and in water. Once the bananas are grown on farms in South America and Asia, we use boats to transport them to the United States. It's a long way from there to here. If we didn't have boats that could make the trip fast enough, all the bananas would spoil, or become unhealthy to eat. There'd be no banana bread for anyone.





Ship Diagram

To get the speed they need, the people who make boat engines use a special source of **fuel**. Fuel is any kind of material that releases **energy** when you burn it. (For example, when you make a campfire, the wood you burn is the campfire's fuel.) One kind of fuel in boat engines—and in many kinds of engines, in fact!—is called oil. (There are other kinds of oils besides the kind we burn in engines, like olive oil or vegetable oil. The kind of oil in engines is a fluid based on **petroleum**.) When it burns inside an engine, it releases gas that pushes up and down on a part called a **piston**. When the piston pumps, it starts to turn the gears of the engine very fast. And those gears turn a boat's **propellers** fast enough to get the bananas to a port, where a truck drives them to your supermarket.



World Without Oil

Our world would be very different without oil. In the days before oil, it really was very different! People ate a less **diversified** diet, and traveled less, and worked in different ways. Before oil, you might never have met anyone from outside your hometown, unless you made a very special effort because travel was slow and hard. Now people travel the world. We know more about one another than we ever did. And, in many ways, that's because of oil.

Gasoline Pump

Oil is a big part of the story of our world. But what's the story of oil? Where did it come from? How did we come to start using it? How can we best use and conserve oil and other natural resources?



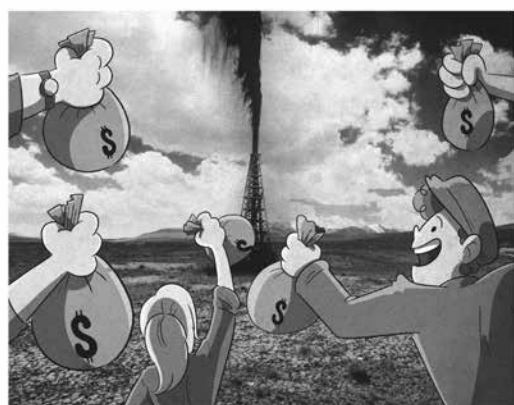
NAME: _____

DATE: _____

1.3

Activity Page

In this unit, we'll answer some of these questions. We'll look at how the energy stored in oil goes all the way back to the sun, which provides energy to all living organisms through the food chain that starts with photosynthesis. Over time, these living organisms died and were sealed underground. There, their bodies broke down and were slowly transformed into the oil we burn. Did you know that when buried for a long time, under high heat and pressure, organisms break down into a chemical called **carbon**? Carbon is the building block of life. Forms of carbon make up all plants and animals, including the human body. It is also the main ingredient in oil.



Spindletop

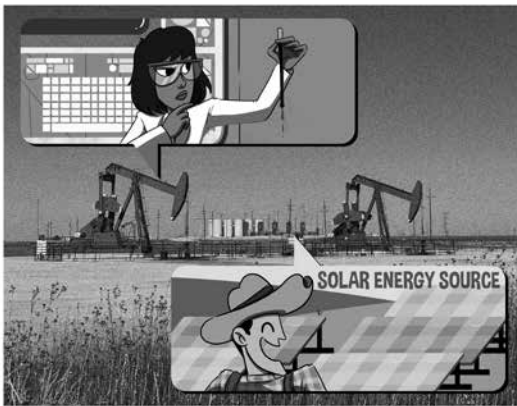
We'll also look at one of the most important discoveries of oil in modern times. That discovery happened in Texas with an **oil well**, a hole dug in the ground to extract oil, called Spindletop, in a city called Beaumont. People had discovered oil before in many places around the world, but the Spindletop well was just the start of a huge supply of oil, and all of it was coming from Texas. Oil was useful to many businesses for all the reasons we talked about and others we will learn about, and that made it **valuable**, or something people wanted to pay a lot of money for. Soon lots of oil was flowing out of Texas, and lots of money was flowing back into it.



Houston Community

The oil business made Texas one of the richest states in the United States, but it also transformed the culture of Texas. Because oil was so important to the **world economy**, or the way goods and services are bought and sold around the world, it brought workers and their families to Houston from all across the country. The economic opportunity brought many African-Americans from the Mississippi Delta, as well as many workers and

their families from Mexico and across Latin America, all contributing to the economy and cultural diversity of Houston. Houston is now home to America's largest Hispanic population. The oil **industry** also attracted many immigrants from countries like Cambodia, Vietnam, India, Pakistan, and Iran. All these people brought their music and cultural traditions with them, too. With so many traditions and people all in the same place, talking to one another and learning from one another, Houston became a **cosmopolitan** city, a city with a culture that traveled the entire world.



Scientists

That's all part of the story of oil. And the story is still being written: no one knows yet exactly what will happen next! These days, scientists are also discovering new energy sources, including renewables, and innovating existing energy sources, such as fossil fuel production and use. Scientists are exploring how to use all of these energy sources more efficiently. For example, improvements in the efficiency of renewables by reducing the number of batteries will reduce the need for mining rare earth metals. Scientists are also looking into ways for fossil fuels to release fewer particles into the atmosphere, such as using industrial scrubbers. We'll look at some of the ideas they've had. And then we'll each become a scientist and decide which of those ideas seems like the best choice for different situations.



Looking to the Future

So, listen carefully as we explore the story of oil! After all, one of you may be the person who writes the next chapter.

NAME: _____

DATE: _____

Directions: Read the selection.

Texas Energy: Variety Is the Spice of Life

Imagine what life would be like if you could only eat one type of food. You might realize that variety is important! From barbeque to international cuisine, many Texans enjoy diverse flavors and spices. In addition to food, Texas is also diverse in another important way: energy sources. Texas has a variety of natural resources available and an innovative energy industry, which makes the state a leader in energy production.

Texas' Unique Geography

Texas' unique geographic diversity gives it an advantage because of the many natural resources that are available. Data from the U.S. Geological Survey shows that Texas has greater diversity of land cover, or types of land, compared to nearly all other U.S. states. The state has forests, plains, mountains, rivers, lakes, deserts, and a long coastline. This diversity provides many different natural resources.

A Variety of Natural Resources

Many of Texas' natural resources are used for energy production, which provides things like electricity, heat, and fuel throughout the state. Oil and natural gas reserves, coal, sun, wind, and uranium—which is used to produce nuclear energy—are all naturally available in Texas. Texans harness, or make use of, the power of fossil fuels—like oil and gas—as well as renewable resources—like wind and solar power. This diverse energy mix is important because it provides multiple energy sources to rely on.

All energy sources have strengths and weaknesses. Using a variety of energy sources means that one source's strengths can balance out another's weaknesses. For example, a strength of solar power is that it uses the sun as a natural resource which, unlike other fuel types, will never expire or run out. However, one weakness of solar power is that the panels used to capture and the batteries used to store the sun's energy are made of materials that can run out. Also, if a state were to rely only on solar power, that state might be at risk of power shortages during less sunny times. Plus, the state would have to spend a lot of money to store the energy once it is produced, to save for less sunny days. Relying solely on solar power would mean that there would be times when there would not be enough energy to power the things people use in their daily lives. There is a lower risk of power shortages when energy can be harnessed from multiple sources. Lastly, because of the abundant natural resources and diverse energy sources that are produced, Texans have access to reliable energy without depending on other states or countries.

Innovations Harness the Power of Natural Resources

Although the natural resources available in Texas give the state an advantage, these natural resources do not create usable energy on their own. The power of natural resources must be harnessed and turned into usable energy. First, people must modify the environment to obtain natural resources. This includes extracting oil and gas or installing windmills and solar panels. Then, the natural resources must be processed, or converted into a useful form. For example, oil refineries process crude oil, transforming it into many different products that can be used for several purposes, such as transportation, heating, and even food preservation.

Texas' strong energy industry works to develop new innovations that improve energy production. Innovations are new inventions or ideas that are created for a purpose. Innovations can solve problems within the energy industry and lead to new opportunities in energy. Let's consider the Texas of the past as an example. According to the Texas State Historical Association, many parts of Texas could not be permanently settled until the mid-1850s because they were too far from a natural water source. At that time, innovations in the design of windmills allowed Texans to access water deep underground. This helped drive the modernization, or development, of those areas. With greater access to water, railroads could more easily power their steam engines, making travel to these parts of Texas easier. Today, new developments continue to solve energy problems in Texas, such as making energy more reliable, reducing environmental impacts, and lowering costs. For example, scientists and engineers are investigating the idea of mixing hydrogen with natural gas to create a mixture that will burn cleaner. As leaders work to improve energy production, the energy industry is constantly changing. This never-ending cycle of innovation keeps the energy industry in Texas strong.

Texas' diverse energy mix is a result of the variety of natural resources available and the innovations of the energy industry. The unique geography of the state provides many different types of energy resources, while innovations harness their power. Which do you think is more important: the variety of natural resources available or the innovations created to harness and produce energy?

NAME: _____

DATE: _____

1.4

Activity Page

Argumentative Essay Prompt

Directions: Read the following prompt.

Texas benefits from a diversified energy industry that harnesses the potential of its variety of natural resources. Argue which of those factors is more important to the diversity of the Texas energy industry: the variety of natural resources Texas has available or innovating to harness the potential of those resources.

Discuss the prompt above with a partner. On the lines below, explain what you are supposed to argue in your essay throughout this unit.

NAME: _____

DATE: _____

1.5

Activity Page

Choosing an Argument

Directions: In the chart below, write the two possible arguments that the writing prompt asks you to choose from. Work with your small group to reread “Texas Energy: Variety Is the Spice of Life” and record the evidence from that text that could be used to support each argument. Write legibly in cursive.

Possible Arguments	Text Evidence

Directions: After you have identified the text evidence for each argument, circle the argument that you think has stronger supporting evidence. This is the argument that you will write about in your essay.

DATE: _____

Directions:

Part 2: Add evidence from the text below each sketch to support the details shown in the drawings.

Sketch 1:	Sketch 2:	Sketch 3:
Text Evidence:	Text Evidence:	Text Evidence:

NAME: _____

DATE: _____

2.2

Activity Page

Make a Claim

Example:

I claim that the people around Spindletop were afraid when oil was first discovered there because the event was loud.

Directions: Make two possible claims in response to the writing prompt on Activity Page 1.4. Try more than one way to write your claim, using key words from the text. Next, write one overall reason to support your claim. (In your argumentative essay, the reasons will become a part of the topic sentences of your body paragraphs). Then, determine which claim makes the strongest argument. Write legibly in cursive.

1. I claim that _____

because _____

_____.

2. I claim that _____

because _____

_____.

NAME: _____

DATE: _____

3.1

Activity Page

“The Beginnings of Oil in the United States” and “Big Changes” Comprehension Questions

1. What are some ways people used oil in the past?

2. What was the problem with using whale oil for light in the nineteenth century?

3. What solution was found to solve the problem with affordable lighting fuel?

4. After Edwin Drake drilled an oil well in 1859, why were hundreds more wells drilled throughout the country?

5. Why did Patillo Higgins suspect that he would find oil in the small hill outside of Beaumont, Texas?

6. What problem was Jim Hamill hired to solve? How did he solve it?

NAME: _____

DATE: _____

7. Why was the rotary drill a successful tool at Spindletop?

8. How did adding mud to the hole help the crew dig?

9. Success at the oil well also created some problems. What problems were created after the oil well blew out?

10. What were the crew's solutions to those problems?

NAME: _____

DATE: _____

3.1

Activity Page

Retell the events at Spindletop by placing them on the following timeline. Include the page number where the event occurs below the event.

Higgins buys
the land.

page #

NAME: _____

DATE: _____

3.2

Activity Page

An Argument in Favor of Natural Gas Led by Texas

Our modern world runs on energy, and the need for it increases with demand. According to the U.S. Energy Information Administration, energy use in America alone increased more than eight times from 1900 to 2011. Energy is used in industries such as farming, transportation, and technology, and is key for their success. One essential source of energy is natural gas, a resource that is abundant in Texas. The production and use of natural gas from Texas as the leading source of energy is critical to meet these increasing demands and ensure America's future.

First, natural gas is critical to meet America's increasing energy demands because it can provide the large supply of energy needed to power our lives. Did you know that in 2011, natural gas was used more than any other source in America? It provided 30 percent of the total energy needed. Natural gas is extracted from shale, a type of sedimentary rock. There are large shale formations throughout Texas that hold enormous amounts of natural gas. Recent innovations in drilling techniques have enabled access to these large reserves, increasing the supply of energy available in Texas. It makes sense to use natural gas because of its abundance and its ability to meet the increasing demands for energy.

Another reason to use natural gas is that it has fewer environmental risks than other sources of energy. It is true that using natural gas requires drilling and releases some pollutants; however, the next-largest source of energy used to produce electricity is coal, which requires harmful and dangerous mining and releases more significant amounts of pollution. For example, today China uses coal as its primary energy source, leading to significant air pollution problems in that country. Other forms of energy used to generate electricity, such as wind and solar, generate less air pollution, but these sources also require mining and large tracts of land. Lastly, because their materials cannot be recycled, these sources still have some negative environmental impacts. (It should be noted that America has regulations that make working in mines safer and cleaner than other parts of the world.)

The third major advantage of using natural gas is its reliability. Wind and solar power can only generate power when the wind is blowing or when the sun is shining. Also, there's a limit to the amount of energy from wind and solar that can be stored by the technology of today's electric companies. Because people need a constant and reliable source of energy,

NAME: _____

DATE: _____

natural gas is the best solution. It is a dependable energy source because it can be consistently obtained from shale deposits all over Texas. Power plants are then able to generate energy 24 hours a day, 7 days a week, 365 days a year. Moreover, innovations have already improved the ability to store fuel and generate electricity from natural gas. As a result, energy production can easily be increased and decreased to match demand, making it available when it is needed.

To sum it up, using natural gas as a core source of energy is key to maintaining our modern quality of life. The natural gas supplied by Texas provides the large amounts of energy we need. Natural gas is more reliable and has fewer environmental risks than other energy sources. Texas can even export natural gas to other countries, helping improve the quality of life for people around the world. The next time you play outside under the lights, power up a computer, or visit the doctor's office, remember the critical role natural gas plays in powering your life!

NAME: _____

DATE: _____

3.3**Activity Page****Argumentative/Opinion/Informational Writing Rubric**

	Score Point 3	Score Point 2	Score Point 1	Score Point 0
Development and Organization of Ideas				
	Fully Developed	Developing	Limited	Not Developed
Central Idea or Argument/Opinion	- The claim is clearly stated and fully developed. - The ideas in the essay are focused to match the claim.	- The claim is stated but may not be fully developed. - The ideas in the essay are not always focused or consistent.	- The claim is stated but not developed appropriately in response to the prompt. - The ideas in the essay are not focused or consistent.	- The claim is not stated. - The ideas in the essay are not focused or consistent.
Organization	- The introduction and conclusion are effective. - The ideas and paragraphs follow a logical order with transitions.	- The introduction and conclusion are included. - The ideas and paragraphs follow a logical order.	- The introduction and conclusion may or may not be included. - The ideas and paragraphs are scattered and unorganized.	- The introduction and conclusion are not included. - The ideas do not follow a logical order.
Evidence	- Claims are supported with relevant evidence from at least two sources. - Evidence is cited properly and flows smoothly. - Ideas are explained in a clear and specific way.	- Claims are supported with relevant evidence from at least one source. - Evidence is cited properly. - Ideas are explained in a somewhat clear way.	- Claims are not supported with relevant evidence. - Ideas are explained in a somewhat unclear or confusing way.	- Claims are not supported with relevant evidence. - Ideas are not explained.
Expression of Language	- Sentence types and lengths are varied to connect ideas logically. - Key words and specific vocabulary from the prompt and text are used effectively.	- Sentence types and lengths are somewhat varied to connect ideas. - Some key words and specific vocabulary from the prompt and text are used.	- Sentence types and lengths are rarely varied. - Sentence structure errors are evident. - Key words and specific vocabulary from the prompt and text are rarely used.	- Sentence types and lengths are not varied. - Sentence structure errors are evident. - Key words and specific vocabulary from the prompt and text are not used.
Language Conventions				
		Consistent	Inconsistent	Little to None
Command of Conventions		Nearly no errors with punctuation, capitalization, sentence structure, grammar nor spelling.	Some errors with punctuation, capitalization, sentence structure, grammar and spelling. Errors do not impact the clarity of the essay.	Many errors with punctuation, capitalization, sentence structure, grammar and spelling. Errors impact the clarity of the essay.
Points: Development and Organization of Ideas ____ + Language Conventions ____ = ____ Total Points (score from 0-5) *Please note that if a response receives a score point 0 in the "Development and Organization of Ideas" category, the response will also earn 0 points in the "Language Conventions" category.				

NOTE: This is a student version of the STAAR Extended Constructed Response Rubric

NAME: _____

DATE: _____

Label the Argumentative Essay

Directions: Read the argumentative essay below. Label each paragraph with the correct part of the essay. Use the model on Activity Page 3.2 that you labeled in class to help you.

Getting a pet is a big decision. Which kind of animal to get is an easy decision. Dogs make the best pets for anyone who wants an animal pal.

Dogs come in many sizes, shapes, and personalities. There is a dog for every person. Not only will they give you endless love and companionship, they are fun! Dogs can learn all kinds of tricks. Having a dog will also make you healthier because you will exercise each time they need a walk.

Lots of parents try to say that a dog is not a good idea for a pet. They say that it is too big. Well, good news! Some dog breeds are so small they can fit in a purse. Allergies are another worry. There are breeds of dog that have hair instead of fur and are great for people who get the sniffles from other furry pets, like cats.

Another reason why dogs make such great pets is because they are loyal. A dog is often referred to as ‘man’s best friend’ and will love their owner no matter what. While some breeds might be more loyal than others, dogs won’t hold it against you if you feed them late or are away from home longer than you planned. Dogs and their owners bond and develop a loyal relationship

If you want to be happy and healthy, you should get a dog. You will take plenty of walks and get a ton of cuddles every day. Dogs are by far the best pets.

NAME: _____

DATE: _____

4.1

Activity Page

“Big Changes”

Directions: Read “Big Changes.” Complete the chart below to retell some of the causes and effects discussed in the text.

Cause	Effect
Men had the chance to earn double the pay earned by workers in the rest of the country.	
There was increased demand for housing.	
There was not enough fresh water.	
	There was little medical attention.
	Fires broke out often.
Many people came to the area for opportunities to make money.	

State a Claim

The oil boom created both problems and innovations. Overall, was the boom in Beaumont a positive experience for the town?

NAME: _____

DATE: _____

“Innovations to Fuel”

Directions: Read “Innovations to Fuel” and consider the challenges being faced by the new oil industry. Using the chart below, record how the problems occurred and the innovative solutions that solved them. Use the example to help you.

Problem		Solution
Cause	Effect	Claim
<i>A large amount of oil gushed from the ground.</i>	<i>Oil flooded the area and caused hazardous conditions.</i>	<i>The workers created a pipe with a valve to cap the oil well.</i>

Think About It

Read the question carefully. Then write your answer.

What is the main message of paragraphs 9 through 11?

Support your answer with evidence from the article.

NAME: _____

DATE: _____

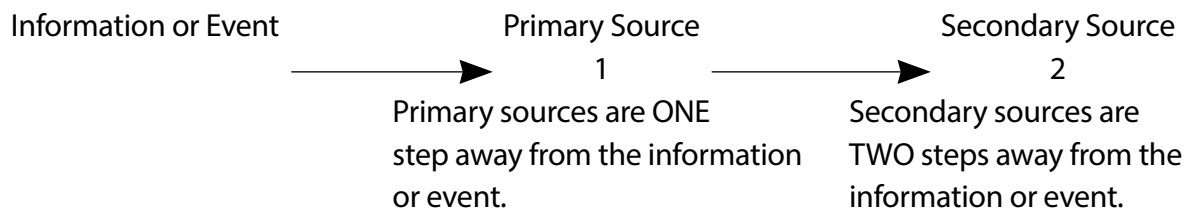
5.2

Activity Page

Primary and Secondary Sources

When researchers are collecting information, they often use primary sources. A primary source comes from a person who knows about a topic firsthand. These sources provide information from the time period of the event. They are useful because they provide evidence left by eyewitnesses or people who lived at the time.

Secondary sources, like books and articles, are created using information from primary sources. These sources are useful because they are easy to find.



Practice

Show whether a resource is primary or secondary by circling the correct term.

Encyclopedia	Primary Source / Secondary Source
Blog written by an eyewitness	Primary Source / Secondary Source
News website	Primary Source / Secondary Source
Journal entry	Primary Source / Secondary Source
Interview	Primary Source / Secondary Source
Photograph	Primary Source / Secondary Source

Try It Out!

One method to collect primary source information is through interviews. Think about who may know about the topic you are researching. Write your interview questions below.

1. _____
2. _____
3. _____

DATE: _____

Activity Page

Directions:

1. Write your questions from Activity Page 5.2 on the lines below.
2. Pick a person to interview. This can be a classmate or an adult.
3. Ask your questions one at a time. Remember to speak slowly and clearly.
4. Write down your subject's answers beside the question. It is fine to ask your subject to repeat something or add more details to help you understand.

Question 1: _____ _____ _____	Answer:
Question 2: _____ _____ _____	Answer:
Question 3: _____ _____ _____	Answer:

NAME: _____

DATE: _____

6.1

Activity Page

Oil Workers

Comparing Oil Workers of Spindletop to the Oil Workers of Today

1. Answer each question in both columns. Remember to support your answer.

	Spindletop Workers	Modern Oil Workers
Where do oil workers do their job?		
How is oil extracted from the ground?		
What are the benefits of being an oil worker?		

2. What else did you learn about modern oil workers that you did not include above? Share at least three more pieces of information.

- _____
- _____
- _____
- _____

NAME: _____

DATE: _____

6.2

Activity Page

Plan for Writing and Research

Directions: Identify the hook and claim you wrote in your introductory paragraph. Then brainstorm a plan for writing your two or three body paragraphs. First, identify the main reasons that defend your claim. Then, identify the text evidence from “Texas Energy: Variety Is the Spice of Life” that you will use. After you identify text evidence, complete the “Explanation of Evidence” boxes. Write your ideas as a bulleted list, not in complete sentences. When you finish all of your body paragraphs, create a plan for your conclusion paragraph.

Paragraph	Plan for Writing
Introduction Paragraph	Hook:
	Claim:
Body Paragraph 1	Topic Sentence with Reason 1:
	Evidence from “Texas Energy: Variety Is the Spice of Life”:
	Explanation of Evidence:

NAME: _____

DATE: _____

Paragraph	Plan for Writing
Body Paragraph 2	Topic Sentence with Reason 2:
	Evidence from "Texas Energy: Variety Is the Spice of Life":
	Explanation of Evidence:
Body Paragraph 3	Topic Sentence with Reason 3:
	Evidence from "Texas Energy: Variety Is the Spice of Life":
	Explanation of Evidence:

NAME: _____

DATE: _____

6.2

Activity Page

Paragraph	Plan for Writing
Conclusion Paragraph	Summary of Main Ideas:
	Restate Claim:
	Memorable Last Sentence:

Directions: Revisit your research to consider how it could be used to explain your evidence. Write your ideas in a bulleted list, not in complete sentences. If needed, conduct additional research that can be used as background knowledge when you write the explanation of the evidence portion of your body paragraphs.

NAME: _____

DATE: _____

7.1

Activity Page

Research Questions

Directions: Use the space below to record possible research questions before beginning your independent research. While reading your selected research materials, continue writing questions for further research. After reading, write at least one question that you would like to research further.

Research Questions:

- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____

NAME: _____

DATE: _____

7.2

Activity Page

Independent Research

Directions: Use the space below to record notes on the questions you chose to research.

	Energy Type:	Energy Type:	Energy Type:
Research Question:	Text Evidence:	Text Evidence:	Text Evidence:
	Source:	Source:	Source:
Research Question:	Text Evidence:	Text Evidence:	Text Evidence:
	Source:	Source:	Source:
Research Question:	Text Evidence:	Text Evidence:	Text Evidence:
	Source:	Source:	Source:

NAME: _____

DATE: _____

8.1

Activity Page

T-Chart Notes “Nuclear Energy”

Directions: Use the following T-chart to take notes as you read “Nuclear Energy.”

Central Idea	Details
How Nuclear Energy Works	
Disadvantages	
Discovery	
Power Plants	
Why Use Nuclear Energy?	
Future	

NAME: _____

DATE: _____

8.2

Activity Page

Sequence Transition Words

first	third	then	last
second	next	finally	afterward

Directions:

Part 1: Rewrite the steps needed to turn the sun's energy into energy people can use. In each sentence, begin with a transition word from the word bank above. Use the text "Nuclear Energy" and your notes from the T-chart on Activity Page 8.1, to help you.

[illegible]

NAME: _____

DATE: _____

8.3

Activity Page

Scoring a Sample Writing

Directions: Read the response to the prompt. Based on the rubric, determine an overall score for the short writing sample.

Prompt: “How are innovations in nuclear energy making it more affordable for Americans?”

Overall Score: _____

Nuclear energy is becoming more affordable. Since its discovery, researchers and scientists have utilized nuclear energy in new innovations. These innovations have impacted people in their daily lives. For example, potential nuclear power plants that are built smaller will reduce the cost and waste of traditional nuclear power plants. This is important since the demand for electricity is particularly high, especially in Texas. Admiral Hyman G. Rickover created ships and submarines for the American navy that ran with nuclear energy. This saved fuel costs for the American government. Overall, innovations in nuclear energy have had and continue to have a positive economic impact on Americans.

NAME: _____
DATE: _____

T-Chart Notes
“Solar, Wind, and Batteries”

Directions: Use the T-chart below to take notes as you read “Solar, Wind, and Batteries.”

Central Idea	Details
Solar Energy	
Wind Energy	
Batteries	
Future	

NAME: _____

DATE: _____

Comparing Wind and Solar Renewable Energy Sources

Directions: Complete the chart below with information from the article.

Central Idea	Pros	Cons
Solar Energy		
Wind Energy		

NAME: _____

DATE: _____

9.3

Activity Page

Research Questions

Directions: Use the space below to record possible research questions for your independent research. What else do you want to know about energy sources? What do you still need to know to support your claims?

Research Questions:

- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____

NAME: _____

DATE: _____

9.4

Activity Page

Independent Research

Directions: Use the space below to record notes on the questions you chose to research.

	Energy Type:	Energy Type:	Energy Type:
Research Question:	Text Evidence:	Text Evidence:	Text Evidence:
	Source:	Source:	Source:
Research Question:	Text Evidence:	Text Evidence:	Text Evidence:
	Source:	Source:	Source:
Research Question:	Text Evidence:	Text Evidence:	Text Evidence:
	Source:	Source:	Source:

NAME: _____

DATE: _____

“Solar, Wind, and Batteries” Claim, Reasons, and Evidence

Directions: Identify the claims, reasons, and evidence in Part 2 of “Solar, Wind, and Batteries.”

Claim	
Reasons	Evidence

NAME: _____

DATE: _____

10.2

Activity Page

Body Paragraph

Prompt: Texas benefits from a diversified energy industry that harnesses the potential of its variety of natural resources. Argue which of the following factors is more important to the diversity of the Texas energy industry: the variety of natural resources Texas has available or innovating to harness the potential of those resources.

Claim: _____

Directions: Use your notes to write a body paragraph supporting your claim.

NAME: _____

DATE: _____

11.1

Activity Page

“Houston: Balancing Energy, the Environment, and the Economy” Analysis Activity

Directions: Answer the questions below for the article “Houston: Balancing Energy, the Environment, and the Economy” located in the Reader. Remember to support your answer with details from the text.

1. What is the central idea or claim the article is making?

2. Why did leaders of the city of Houston want to produce their own energy?

3. How do the innovations that the city of Houston is making help the city’s economy?

4. What innovations in Houston have made it better for the people who live there?

NAME: _____

DATE: _____

11.2

Activity Page

Write Your Argumentative Essay

Checklist	Completed?
Introduction: State the claim.	☐
Two or Three Body Paragraphs: Defend the claim.	☐ ☐ ☐
Conclusion: Restate the claim.	☐

11.2

NAME: _____

DATE: _____

[illegible]

NAME: _____

DATE: _____

12.1

Activity Page

The Boy Who Harnessed the Wind

Directions: Explore the challenge faced by William in his village. Complete the chart below by answering the questions in each box.

Problem: What problem does the village face?

Cause: What caused this problem?

Effect: What effects does this have on the village?

Claim: What does William believe will fix the problem?

What challenges does he face?

Solution: How is the problem solved?

Think About It:

How does a wind turbine work? Can any be found in Texas? Use your research skills to find out!

NAME: _____

DATE: _____

12.2

Activity Page

Revising and Editing Checklists

Revising Checklist	After checking for each item, place a checkmark here.
The central idea and details in each paragraph match.	
There are a variety of short, medium, and long sentences.	
The words were carefully chosen for the essay's purpose.	
Transition words are used between ideas and paragraphs.	
There are adverbs and prepositions that add clarity and interest to the essay.	

Editing Checklist	After checking for each item, place a checkmark here.
Complete sentences with subject-verb agreement	
Correct capitalization	
Correct spelling, including irregular past-tense verbs , adverbs, and prepositions	
Correct punctuation	

NAME: _____

DATE: _____

12.3

Activity Page

Partner Checklist

Your Name: _____ Your Partner's Name: _____

Directions: Check the boxes and fill in the spaces below based on your partner's essay.

☐ Claim: _____

☐ Evidence to support the claim:

- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____

Revision	
☐	The central idea and details in each paragraph match.
☐	There are a variety of short, medium, and long sentences.
☐	The words were carefully chosen for the essay's purpose.
☐	There are adverbs and prepositions that add clarity and interest to the essay.
Editing	
☐	Correct grammar
☐	Correct capitalization
☐	Correct spelling, including irregular past-tense verbs
☐	Correct punctuation

12.3

NAME: _____

DATE: _____

Give a Compliment

Tell your partner which piece of evidence convinced you the most to agree with the claim and why.

DATE: _____

	To Do <i>Add checkmark when complete</i>
☐ All details match the central idea or topic. ☐ Text is clear and easy to read. ☐ Images match the details on the page. ☐ Images add information. ☐ Design is neat and visually appealing. ☐ Error-free	
Partner Checklist	Positive Comments:
☐ All details match the central idea or topic. ☐ Text is clear and easy to read. ☐ Images match the details on the page. ☐ Images add information. ☐ Design is neat and visually appealing. ☐ Error-free	
Ideas for Improvement:	

NAME: _____

DATE: _____

14.1

Activity Page

Audience Feedback

- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____

NAME: _____

DATE: _____

14.2

Activity Page

Reflection

Name three new things you learned in this unit.

1. _____
2. _____
3. _____

Name one thing you learned that surprised you.

- _____

Name an activity that you were able to do easily.

- _____

Name an activity that was challenging for you.

- _____

What else would you like to share about your work that hasn't been asked?

Final claim statement: Imagine you are fifty years old. Use your knowledge to make a claim about the future of energy sources.

NAME: _____

DATE: _____

Grammar Practice

Directions: Fill in the blank with the past-tense form of the verb in parenthesis.

1. My family _____ to Palo Duro Canyon on vacation. (*go*)
2. We _____ there from Dallas. (*drive*)
3. We _____ a show at the amphitheater. (*see*)
4. My legs _____ after our long hike. (*shake*)

Directions: Fill in the blanks with the correct adverbs from the word bank.

always	rarely	almost
--------	--------	--------

5. I _____ finished my homework, but I forgot to answer the last question.
6. I was very excited when my mom bought candy because she _____ buys it.
7. The sun _____ comes out again after a storm.

Directions: Revise each sentence for clarity by adding a prepositional phrase.

8. There is a field of bluebonnets _____.
9. We passed a large oil refinery _____.
10. Antonio went to the rodeo _____.

NAME: _____

DATE: _____

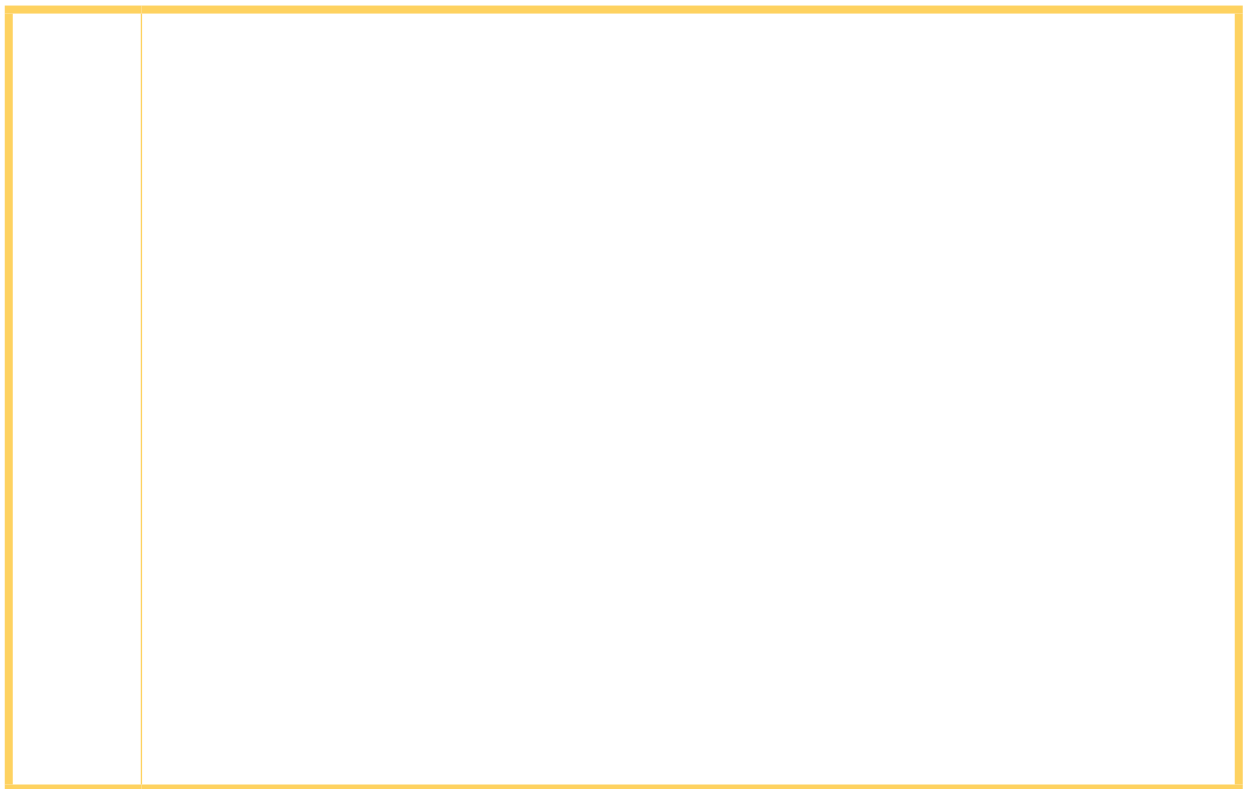
PP.2

Activity Page

Research Guide

Directions: You have been hired to write a guide for conducting research. In your guide, you should explain the process of conducting research, including how to identify questions for research, types of sources, and strategies for note-taking. Once you have finished writing, you can cut the pages out and staple or glue them together on the left side of each page to create a booklet.

Design your cover.



NAME: _____

DATE: _____

Types of Resources:**Strategies for Note-Taking:****How to Identify Questions for Research**

NAME: _____

DATE: _____

PP.3

Activity Page

Parts of an Argumentative Essay

Part A: Read the prompts below. Determine which prompt leads to an argumentative essay and explain your reasoning.

Prompt 1:

Describe your favorite recreational activity in which you participate. Include how often you do it, when and where you do it, and why you do it.

Prompt 2:

Which recreational activity has the most benefits: exercising or reading? Clearly state your answer and support it with evidence.

Part B: Write an argumentative essay in response to the prompt you answered for Part A.

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K-5 Reading Language Arts

ENGLISH

**INNOVATION
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GRADE 4 UNIT 9 | ACTIVITY BOOK

EDITION 1

