Amplify. TEXAS
ELEMENTARY LITERACY PROGRAM

ENGLISH

Grade 4

Unit 8 | Teacher Guide

Energy

Grade 4 | Unit 8

Energy:
Past, Present, and Future

Teacher Guide

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Grade 4 | Unit 8

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Introduction

ENERGY: PAST, PRESENT, AND FUTURE

This introduction includes the necessary background information to teach the *Energy: Past, Present, and Future* unit. This unit contains 15 daily lessons, each composed of a reading and writing segment and requiring a total of 90 minutes. Lesson 15 is devoted to celebrating student work and does not contain a reading segment.

The texts in this unit include a Read-Aloud and a collection of trade books. This text sequence follows a timeline of energy development. They begin with an in-depth look at the discovery of oil in Texas at the turn of the 19th century and move forward in time to include modern stories across the world. In addition, the texts explore the variety of energy sources used today and invite the students to become empowered energy leaders of tomorrow.

INSTRUCTIONAL MATERIALS

Along with this Teacher Guide, which includes answer keys and other Teacher Resources located in the back pages, you will need:

- activity pages for *Energy: Past, Present, and Future*
- research materials to investigate a variety of fuels, including fossil fuels and renewable fuels. (More details are available in Lesson 6, where you will first use these materials.)
- computer access for each student or art supplies, such as large format paper and coloring materials

You will also need a classroom copy of each of the following trade books, which are available at physical and online bookstores:

- *Buried Sunlight: How Fossil Fuels Have Changed the Earth* by Molly Bang and Penny Chisholm
- *Oil Rig Workers: Getting the Job Done* by Jill Sherman
- *Energy Island: How One Community Harnessed the Wind and Changed their World* by Allan Drummond
- *The Boy Who Harnessed the Wind: Picture Book Edition* by William Kamkwamba and Bryan Mealer

In addition to the trade books used in this unit, you will need access to copies of the following digital texts:

- ReadWorks Passage: “Clean Energy”
- ReadWorks Passage: “Houston Affects the Earth”
- ReadWorks Passage: “Energy for Life”

WHY ENERGY: PAST, PRESENT, AND FUTURE IS IMPORTANT

Students will become tomorrow's problem solvers in this study of energy in the United States. Analytical reading skills are developed by examining the challenges of early energy innovators. The students will then read about current energy practices, and young energy change makers across the world. Throughout the unit, students will conduct research into different sources of energy and present a proposal, putting them in the shoes of future energy innovators.

The students will use the knowledge sequence in this unit to:

- collaboratively analyze texts to identify causes-effect and problem-solution relationships,
- generate questions and conduct research about energy,
- write an argumentative essay making their case for a fuel of the future,
- create energy proposals using primary and secondary resources.

WHAT STUDENTS HAVE ALREADY LEARNED

The following domains, and the specific core content that was targeted in those domains, are particularly relevant to the lessons in *Energy: Past, Present, and Future*. This background knowledge will enhance your students' understanding of the texts they will read:

Kindergarten, Plants: How Do They Grow

Grade 1, The History of the Earth

Grade 4, Eureka! The Art of Invention

CORE CONTENT OBJECTIVES

The following Core Content Objectives are addressed in this domain:

- Identify central ideas and key details in the text.
- Identify cause/effect and problem/solution relationships in the text.
- Make and defend a claim using textual evidence.
- Make inferences in texts and draw conclusions.
- Identify and gather primary and secondary source information.
- Draft, revise, and publish an argumentative essay.

The texts that students will be interacting within this unit also provide opportunities for students to build content knowledge and draw connections to the social studies and science subject areas, but they do not explicitly teach the Texas Essential Knowledge and Skills standards for Social Studies or Science. At times throughout the unit, you may wish to build on class discussions to support students in making cross-curricular connections to the strands of Economics, Geography, History, Science, technology and society, Force, motion and energy, and Scientific investigation and reasoning from the social studies and science disciplines.

WRITING

In the writing lessons, students will engage in a research and writing process to produce argumentative essays and multimodal presentations. Students will use background knowledge from the readings to generate research questions that investigate the essential question "What are the fuels of the future?" Throughout the unit, students use the Internet and classroom resources to identify and gather information from a variety of sources. They will learn about paraphrasing and summarizing through note taking and work with primary sources as they interview classmates and family members. The culminating essay may be added to students' writing portfolios to showcase student writing.

CORE VOCABULARY FOR ENERGY: PAST, PRESENT, AND FUTURE

The following list contains all of the core vocabulary words in *Energy: Past, Present, and Future* in the forms in which they appear in the Read-Alouds, independent reading, and partner readings. In some instances, the words are included because they are integral to the knowledge building within a lesson. The inclusion of the words on this list does not mean that students are immediately expected to be able to use all of these words on their own. However, through repeated exposure throughout the lessons, they should acquire a good understanding of most of these words and begin to use some of them in conversation.

Lesson 1
carbon
cosmopolitan
energy
fuel
oil
oil well
petroleum
valuable

Lesson 2
ancient
bacteria
carbon dioxide
evolved
fossil fuels
oxygen
photosynthesis
sequence

Lesson 3
bit
blunt
boiler
buggies
claim
debris
derrick
evidence
rotary drill
trenches
visualize

Lesson 4
ambitious
argumentative
compressed
conclusion
deposit
depression
essay
excavations
extract
film
flammable
introduction
investor
paragraph

Lesson 5
abundant
fumes
host
polluted
scams
speculators

Lesson 6
barges
contaminated
conveyor belt
demand
goods
innovation
modifying
synthetic

Lesson 7
biogas
fermentation
fractured
horizontally
impermeable
innovative
potential
renew
vertically

Lesson 8
primary (source)
secondary (source)

Lesson 9
dependence
generate
nonrenewable
renewable

Lesson 10
counterclaim
defend
support

Lesson 11
edit
revise

LESSON

1

Banana Bread and the Story of Oil

PRIMARY FOCUS OF LESSON

Core Connections

Students will identify inventions that are vital to modern conveniences in a group discussion. TEKS 4.1.A; TEKS 4.1.C

Reading

Students will discuss the Read-Aloud, including the connection between oil and innovation. TEKS 4.1.A

Writing

Students will engage in a brainstorm activity that will generate connections and seeds for research questions. TEKS 4.11.A

FORMATIVE ASSESSMENT

Activity Page 1.5

Think About It Students answer the prompt "Name three important uses of energy in your daily life." TEKS 4.11.A

TEKS 4.1.A Listen actively, ask relevant questions to clarify information, and make pertinent comments; **TEKS 4.1.C** Express an opinion supported by accurate information, employing eye contact, speaking rate, volume, and enunciation, and the conventions of language to communicate ideas effectively; **TEKS 4.11.A** Plan a first draft by selecting a genre for a particular topic, purpose, and audience using a range of strategies such as brainstorming, freewriting, and mapping.

LESSON AT A GLANCE

	Grouping	Time	Materials
Core Connections (10 min.)			
Making Connections	Whole Group	5 min.	❑ Activity Pages 1.1, 1.2
Introducing Oil	Whole Group	5 min.	
Reading (35 min.)			
Read-Aloud	Whole Group	15 min.	❑ KWL chart ❑ enlarged projection of the text on Activity Page 1.3 ❑ Image Cards 1A-1–9 ❑ chart paper ❑ markers
Revisiting the Text	Partners	10 min.	
Making Predictions	Whole Group	10 min.	
Writing (45 min.)			
Brainstorming Activity	Whole Group	10 min.	❑ Activity Pages 1.3, 1.4, 1.5 ❑ chart paper ❑ markers
Brainstorming in Groups	Small Group	10 min.	
Using a Sorting Organizer	Small Group	10 min.	
Responding to the Prompt	Independent	15 min.	

ADVANCE PREPARATION

Core Connections

- Prepare groups of two or three students to complete Activity Page 1.1.

Reading

- Prepare an enlarged copy or projection of the Read-Aloud text on Activity Page 1.3.
- Prepare images of key vocabulary words for use with ELL students.
- Display a blank KWL chart on chart paper or a digital whiteboard.

Know	Wonder	Learn

Writing

- Prepare a word bank with common fuel-run machines for ELL students' use with Activity Page 1.4.
- Group students purposefully, providing peer models as well as peers with similar needs. Some students may benefit from homogenous groupings with adult support, as needed.

Universal Access

Reading

- Students following along on their copy may benefit from a visual aid, such as a straight edge, to assist with tracking on the page.
- Allow adequate thinking time for students to respond during the discussion. Post your guiding questions on the board and refer to them as you ask the questions.

Writing

- Provide access to a word processor with voice to text software or browser extension.

CORE VOCABULARY

carbon, n. a naturally occurring chemical element found in living things

cosmopolitan, adj. containing people from many places and cultures

energy, n. power needed to run a machine
n. power needed for physical activity

fuel, n. a substance that can be burned as a source of energy
n. a substance, such as food, that is used to give the body energy
v. to supply power or energy
Example: fuel an argument

petroleum, n. liquid found inside the earth that is removed and processed to create different products such as fuels and plastics

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

oil well, n. a shaft drilled into the ground to extract petroleum

valuable, adj. of high worth

Vocabulary Chart for "Banana Bread and the Story of Oil"		
Vocabulary Type	**Tier 3 Domain-Specific Words**	**Tier 2 General Academic Words**
Core Vocabulary	petroleum carbon oil well oil	valuable cosmopolitan
Multiple-Meaning Core Vocabulary Words	energy fuel	
Sayings and Phrases		

Lesson 1: Banana Bread and the Story of Oil

Core Connections

10M

Primary Focus: Students will identify inventions that are vital to modern conveniences in a group discussion. **TEKS 4.1.A; TEKS 4.1.C**

MAKING CONNECTIONS (5 MIN.)

Activity Page 1.1

- Explain that many everyday tasks are easier thanks to modern inventions. Display an enlarged chart, as seen on Activity Page 1.1.
- Show students the examples on their copy of the chart in their activity page. Allow students to write and ask a question they have about the categories on the chart: Communication, Health and Medicine, Food, and Transportation. In groups of two or three students, direct the students to complete the activity page.
- Bring the students back together and share the ideas they generated in their groups. Record these on the chart being displayed.
- Explain that together you will explore what powers these inventions later in the lesson.

INTRODUCING OIL (5 MIN.)

Activity Page 1.2

- Introduce oil as a fuel that gives us energy.
- Direct students to Activity Page 1.2. Review the definitions and ask students to complete the exercise on the page.

TEKS 4.1.A Listen actively, ask relevant questions to clarify information, and make pertinent comments; **TEKS 4.1.C** Express an opinion supported by accurate information, employing eye contact, speaking rate, volume, and enunciation, and the conventions of language to communicate ideas effectively.

Lesson 1: Banana Bread and the Story of Oil

Reading

35M

Primary Focus: Students will discuss the Read-Aloud, including the connection between oil and everyday innovations. **TEKS 4.1.A; TEKS 4.6.C**

READ-ALOUD (15 MIN.)

- Remind students of the key words for the lesson *(oil, fuel,* and *energy)*.
- Display the Read-Aloud and show students where these words appear in the text.
- Ask students to identify which of the words' definitions apply in the text.
- Display the KWL chart. Tell students that the class will fill this in throughout the unit. Today we will begin by filling out the Know column using existing knowledge and what is read in the text.
- Read the text to the students.
- As ideas are added to the chart, color code by key vocabulary word. For example, write all ideas related to oil in green, and ideas related to fuel and energy in two different colors.
- Stop at the marked points in the text to check for understanding through the discussion questions.

"BANANA BREAD AND THE STORY OF OIL"

Show Image 1A-1: Banana Shopping

Suppose you're watching a cooking show you really love. There's a recipe for banana bread, a type of sweet bread. "Hmm," you think. "I'd like to try cooking that!"

So 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.

Challenge

Ask students to prepare definitions of the additional bolded vocabulary in the text to be shared during the Read-Aloud.

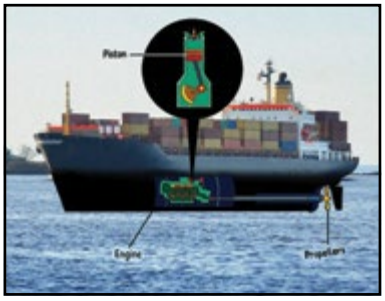
Support

When encountering key vocabulary in the text, prompt students to refer to the definitions on Activity Page 1.2 to promote comprehension.

TEKS 4.1.A Listen actively, ask relevant questions to clarify information, and make pertinent comments **TEKS 4.6.C** Make, correct, or confirm predictions using text features, characteristics of genre, and structures.

Show Image 1A-2: 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. 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. *Why is the author discussing bananas in a story about oil?* What kind of energy do bananas use to grow? *(sun or solar)*



Show Image 1A-3: 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 based on a fluid called **petroleum**.) Engine oil is very easy to set on fire! 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. *What do you think turns the wheels on the truck?*

Show Image 1A-4: World Without Gas

Our world would be very different without oil. In the days before oil, it really was very different! People ate different foods, traveled less, and worked in different ways. Before oil, you might never meet anyone from outside your hometown, unless you made a very special effort. Now people travel the world. We know more about one another than we ever did. And in many ways, that's because of oil. *Do you know anyone who comes from a different town, or a different city, or a different country? Are you someone who comes from one of those places?*

Show Image 1A-5: 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? Will we keep using it forever? And if not, what's going to come next?

In this unit, we'll answer some of these questions. We'll look at how far back the story of oil goes: all the way to prehistoric times and the age of the dinosaurs! Oil began with living beings, especially prehistoric animals and plants. Over time, these living creatures died and were sealed underground. There, their bodies broke down and were slowly transformed into the oil we burn. (One reason oil burns so well is that it's made up of **carbon**, a key part of the cells of all living organisms.)

Show Image 1A-6: 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**, or 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 coming from Texas. Oil was useful to many businesses for all the reasons we talked 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.

Show Image 1A-7: 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. Many of the workers were Black people from the Mississippi Delta, home of the Delta blues. They brought their music with them, which

combined with Texas country and gospel music to form a new style. And over time, the children and grandchildren of the Black oil workers formed a large Black population in Houston. 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. *Could you retell some of the ways culture was transformed by the oil business?*

Show Image 1A-8: Scientists

That's all part of the story of oil. And the story is still being written: no one knows yet exactly how it's going to end! These days, scientists are also discovering lots of new kinds of energy sources, including renewable energy sources. Scientists are exploring how to use sources of renewable energy that will do everything oil did, but without running out. 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 the start of the next story our society tells. *Can you think of other sources of energy that we might learn about?* (wind, solar or sun, hydropower or water).

Show Image 1A-9: Looking to the Future

So listen carefully as we explore the story of energy! After all, one of you may be the person who writes the end of it.

REVISITING THE TEXT (10 MIN.)

- Refer to the KWL chart you have prepared.
- Ask students to turn and talk to a neighbor about what they now know about oil. Ask students to share what their neighbor said.
- Encourage students to refer to the text when adding information they heard in the Read-Aloud.
- Ask students to share a question they have about oil after listening to the text.
- Record student suggestions, continuing to utilize color-coding.

MAKING PREDICTIONS (10 MIN.)

- Ask students, "Based on what we read today, what do you predict we will learn about in this unit?"
- These may be displayed on a chart paper or other classroom display for future reference.
- Introduce the culminating activity. Tell students that oil is one of several fuels in this unit. They will be conducting their own research about fuels that give us energy. At the end of the unit they will create a proposal sharing what they believe will be a fuel of the future. First, they will learn about the fuels of the past and today. Just as in the end of the story, the students will get to tell what comes next in the story of oil.

Check for Understanding

Ask students to use a key vocabulary word in a sentence or restate the definition in their own words.

ENGLISH LANGUAGE LEARNERS

Speaking and Listening
Discussion

Beginning
Post images of key vocabulary as a pre-reading support. Phrase questions in a yes/no format during class discussion.

Intermediate
Provide the following sentence starters as a pre-reading support:

I know that oil . . .

I predict we will learn . . .

Advanced/Advanced High
Preview key vocabulary prior to the lesson. Help the students make personal connections to the vocabulary to build contextual understanding.

ELPS 2.E; ELPS 4.D

Lesson 1: Banana Bread and the Story of Oil

Writing

45M

Primary Focus: Students will engage in a brainstorm activity that will generate connections and seeds for research questions. **TEKS 4.11.A**

BRAINSTORMING ACTIVITY (10 MIN.)

- Remind students that the Read-Aloud text mentioned how engines in cars and boats are fueled by the energy created by oil.
- Show where this appears in the text using the enlarged class copy or by referring students to their own copies.
- Prompt students to think about other inventions in our everyday life that need fuel to run.
- Allow students to have a minute of thinking time, then turn and share with a neighbor.
- Record a few student answers on a large piece of chart paper or other display such as a digital white board. The display used should preserve the work for later reference. *(Responses may include cars or home appliances, such as refrigerators, lights, television, and toys. Any energy source is appropriate, including oil-based fuels, such as heating oil, gasoline and natural gas, batteries, solar power, or wind turbines.)*

BRAINSTORMING IN GROUPS (10 MIN.)

- Transition students into their small groups.
- Have students continue to generate contributions in small groups. Student work may be added to the class chart by sharing out verbally following time to work or by placing them directly on the chart with sticky notes or another preferred method.

Challenge

Ask students to categorize all of the contributions to the class chart. The students may add additional columns on a separate sheet of paper to accommodate additional categories due to the increased number of items to be sorted.

Support

Supply the students with an example in each category of the sorting organizer as a model.

TEKS 4.11.A Plan a first draft by selecting a genre for a particular topic, purpose, and audience using a range of strategies such as brainstorming, freewriting, and mapping.

USING A SORTING ORGANIZER (10 MIN.)

- Remaining in the small groups, direct students to Activity Page 1.4.
- Assist students in categorizing the contributions by the type of fuel used as the energy source for each.
- Conference with individual groups as they finish brainstorming. Assist students with categorizing their ideas and labeling the columns of their sorting organizer. Useful labels include: fossil fuels (gasoline, heating oil, propane), batteries, sun, and wind.
- Direct students to sort their ideas using the columns titles on their sorting organizer.
- Transfer categories generated in the groups to the class chart.

RESPONDING TO THE PROMPT (15 MIN.)

- Direct students to answer the prompt "Name three important uses of energy in your daily life." on Activity Page 1.5. Remind students to use the work from their groups or the class chart for ideas. Collect the page when the students are finished.

Check for Understanding

Ask students to use the key vocabulary words from "Banana Bread and the Story of Oil," *oil* and *fuel*, in a sentence and restate the definitions being used in their own words. Remind students that both *oil* and *fuel* have more than one meaning.

End Lesson

Activity Page 1.4

ENGLISH LANGUAGE LEARNERS

Speaking and Listening
Discussion

Beginning
Ask the students if they agree or disagree with each idea as they are brainstormed rather than expecting additional contributions.

Intermediate
Provide the following sentence starters for participating in small group discussion:

I think that . . .

I agree with you because . . .

I disagree with you because . . .

Advanced/Advanced High
Encourage the use of the key vocabulary words during group discussion.

ELPS 1.F; ELPS 2.E; ELPS 3.D

Activity Page 1.5

LESSON

2

Hidden Energy

PRIMARY FOCUS OF LESSON

Speaking and Listening

Students will listen to a review of the content from the previous lesson and respond using visual aides referencing that work. TEKS 4.1.A

Reading

Students will read and identify key ideas about oil, including "What is oil?," "Where do we find oil?," and " How does oil provide energy?" through guided note-taking. TEKS 4.6.G

Writing

Students will interact with the text through guided note-taking.
TEKS 4.6.G; TEKS 4.7.E

FORMATIVE ASSESSMENT

Activity Page 2.2

Retell Students will retell the key events in the creation of oil in a partner sequencing activity.
TEKS 4.6.G

TEKS 4.1.A Listen actively, ask relevant questions to clarify information, and make pertinent comments; **TEKS 4.6.G** Evaluate details read to determine key ideas; **TEKS 4.7.E** Interact with sources in meaningful ways such as notetaking, annotating, freewriting, or illustrating.

LESSON AT A GLANCE

	Grouping	Time	Materials
Speaking and Listening (5 min.)			
Making Connections from Lesson 1	Whole Group	5 min.	❑ class-generated KWL chart from Lesson 1 ❑ class-generated Sorting Organizer chart from Lesson 1
Reading (25 min.)			
Model Note-Taking	Whole Group	25 min.	❑ *Buried Sunlight: How Fossil Fuels Have Changed the Earth* ❑ chart paper ❑ markers ❑ Activity Page 2.1
Writing (60 min.)			
Guided Practice: Taking Notes	Small Group	35 min.	❑ model notes from the *Buried Sunlight* reading segment demonstration, created during the reading segment ❑ student access to pages 6–18 of *Buried Sunlight*; one copy for each group's assigned portion. ❑ enlarged version of the T-chart found on Activity Page 2.1, copied onto chart paper or reproduced in a digital display ❑ Activity Pages 2.1 and 2.2 ❑ chart paper ❑ markers ❑ sentence strips for each student (index cards or large sticky notes may also be used)
Writing with Transition Words	Whole Group	15 min.	
Arranging a Sequence	Partners	10 min.	

ADVANCE PREPARATION

Speaking and Listening

- Display the KWL chart and class Sorting Organizer from Lesson 1.

Reading

- Prepare and display a piece of chart paper or digital whiteboard with a model T-chart, as seen on Activity Page 2.1.
- Post sentence starters for ELL students to use when contributing to the whole class note-taking demonstration.

Writing

- Prepare small groups of three or four students.
- Divide pages 6–18 among the groups. Number of pages will vary depending on the number of student groups.
- Prepare to distribute a portion of the text for each group, depending on the size and needs of each group.
- Make *Buried Sunlight* or only the images from the book available to ELL students and their partners during the sequencing activity.
- Prepare to distribute sentence frames to ELL students as they begin group work.

Universal Access

Reading

- Provide access to copies of the T-chart model, to assist with tracking and copying, as necessary.

Writing

- Provide access to a word processor to use with a digital version of the Activity Page 2.1 and Activity Page 2.2.

CORE VOCABULARY

photosynthesis, n. the process in which plants convert light into energy and release oxygen

fossil fuels, n. natural fuels created from carbon stored in the remains of living things

sequence, n. an order or arrangement in which one thing follows another

ancient, adj. very old, from a long time ago

carbon dioxide, n. a gas created by burning fossil fuels that is also absorbed by plants

oxygen, n. gas found in the air and produced by plants during photosynthesis

bacteria, n. microscopic organisms that were some of the first to appear on Earth

evolve, v. to change over time from simple to more complex

Vocabulary Chart for "Hidden Energy"

Vocabulary Type	**Tier 3 Domain-Specific Words**	**Tier 2 General Academic Words**
Core Vocabulary	photosynthesis fossil fuels carbon dioxide oxygen bacteria	sequence ancient evolved
Multiple-Meaning Core Vocabulary Words		
Sayings and Phrases		

Lesson 2: Hidden Energy

Speaking and Listening

5M

Primary Focus: Students will listen to a review of the content from the previous lesson and respond using visual aides referencing that work. **TEKS 4.1.A**

MAKING CONNECTIONS FROM LESSON 1 (5 MIN.)

- Display the whole class KWL chart and whole class Sorting Organizer from Lesson 1.
- Draw the students' attention to the whole class Sorting Organizer. Remind students that during the last class they worked together to think of ways oil is important in their daily lives. Ask students to name some of these ways using the chart as a memory jogger.
- Draw the students' attention to the KWL chart. Remind students that last class's reading taught them some information about oil and how it shapes communities. Ask students, "What are some things we know about oil from that story?" *(Responses may include that oil comes from underground, engines run on oil, distant travel was made possible, workers from around the world come to work jobs in oil, etc.)*
- Have students write a question they have about oil on the Wonder column of their KWL, and allow a few student volunteers to share their questions with the class.
- Tell the students that they will read more about oil today and add to the Know column of the KWL chart.

TEKS 4.1.A Listen actively, ask relevant questions to clarify information, and make pertinent comments.

Lesson 2: Hidden Energy

Reading

25M

Primary Focus: Students will read and identify key ideas about oil, including "What is oil?," "Where do we find oil?," and "How does oil provide energy?" through guided note-taking. TEKS 4.6.G

MODEL NOTE-TAKING (25 MIN.)

- Draw the students' attention to the layout of Activity Page 2.1. Explain that this is called a T-chart and that T-charts have a column on the left for the central idea and a column on the right for details. It is called a T-chart because the lines make a T at the top. Explain to students that a central idea can be determined by identifying key ideas in the text.
- Draw the students' attention to the words already printed in the central idea column. Point to them on the enlarged copy of Activity Page 2.1 being displayed. Tell the students that some of the work has already been done for them: the central ideas are filled in.
- Explain to the students that they will be using T-charts to conduct research later in the unit. They will be in charge of their own research and will get to decide the key ideas for their notes. Today we will only practice gathering details.
- Display page 1 of *Buried Sunlight*. Read the text aloud.

  "I am your sun, your golden star. Even from 93 million miles away, I warm your land, your seas, your air, and chase the darkness from your days. My energy gives light and life to your tiny Earth."

- Ask the students what the key idea of the page is. *(Correct responses should include the word energy, the sun's energy or an equivalent.)*
- Ask the students to look for the key idea on their T-chart. When they find it, direct students to point to it on their paper and give a thumbs up. Ask a student to show where to place the correct answer, *energy* or *the Sun's energy*, on the model notes.

Activity Page 2.1

TEKS 4.6.G Evaluate details read to determine key ideas.

Challenge

Direct students to avoid using any direct quotations from the text. All sentences on Activity Page 2.1 should be paraphrased in students' own words.

Support

Provide a copy of the assigned portion of *Buried Sunlight* that has been highlighted to assist in locating details and key words.

- Demonstrate how to find the relevant details in the text. Say, "The next thing I would do when taking notes is ask myself, 'What details about the central idea do I see here?' The central idea is energy, so I am looking for details about energy."
- Model rereading the page to yourself aloud.

  Say, "I think I see a detail here, where it says 'My energy gives light and life.' Would you agree that this detail matches my central idea? Give me a thumbs up or thumbs down. You can give me a thumb in the middle if you aren't sure."

  Say, "At the start of the page it told me the narrator is the sun. I can also see that from this picture. So, I know 'my energy' means the sun's energy. When I add this detail to my notes I will write *the sun* instead of *my*. This will help me remember where energy comes from when I look back at my notes."
- Write "the sun gives light and life" in the details column of the chart paper prepared with a model T-chart. Ask the students to add this detail to their own T-charts on Activity Page 2.1 as well.
- Turn to pages 2–3 in *Buried Sunlight*. Read the text to the students.

  "Yes, living things—including YOU—need energy to stay alive and grow..."
- Ask the students if the central idea is still energy. Ask students to show their response with a thumbs up, down, or in the middle. Confirm that the central idea is still energy and that you will continue to write beside that central idea on the model T-chart.
- Ask students to turn to a neighbor and find a detail on this page that could be added to the notes. Pause for partners to discuss. Invite the students to share their partner's response. Add these details to the class model.
- Turn to page 4–5 on the enlarged copy. Read the text to the students.

  "Most of it comes from coal... "
- Ask the students if the central idea is still energy. Ask students to show their response with a thumbs up, down, or in the middle. Confirm that the central idea is no longer about energy.
- Ask the students to point to the new central idea on their T-charts. Direct students to give a thumbs up when they think they have found the next central idea. Ask for a volunteer to share the new central idea (fossil fuels). Add this to the model T-chart.

- Ask students where fossil fuels come from. Correct responses should include ancient plants. Address any confusion about whether dinosaurs are a source of fossil fuels *(they are not but are used in the text as an example of ancient life)*.
- Tell the students that you will reread these pages. They should listen for at least one detail about the new central idea, fossil fuels.
- Reread pages 2–3.
- Ask students to turn to a neighbor and find a detail on this page about fossil fuels. Pause for partners to discuss. Invite the students to share their partner's response. Add these details to the class model.

Check for Understanding

Ask students to show their readiness to work with a group by giving a signal: thumb up = ready, thumb in the middle = ready but may need some help, thumb down = I am not ready. Take note of students who did not give a thumbs up and check on them as they work in their groups. At the end of the lesson, examine those students' work for misunderstanding related to note taking. Reteaching can take place in lesson seven when there are additional opportunities for practicing note taking.

ENGLISH LANGUAGE LEARNERS

Speaking and Listening
Discussion

Beginning
Preview the T-chart model 1:1 or in a small group before reading. Ask students to use a non-verbal cue to show if they agree when their classmates add a detail.

Intermediate
Preview sentence starters before reading that students will use when responding during the whole class note-taking demonstration.

Advanced/Advanced High
Preview the words used for the central ideas on Activity Page 2.1. Provide a copy of the definitions for students to reference during the lesson.

ELPS 1.D; ELPS 2.E; ELPS 4.D

Lesson 2: Hidden Energy

Writing

60M

Primary Focus: Students will interact with the text through note-taking and restating relevant facts in a sequence. **TEKS 4.6.G; TEKS 4.7.E**

GUIDED PRACTICE: TAKING NOTES (35 MIN.)

- Tell the students that they will now continue to take notes in small groups.
- Assign a portion of *Buried Sunlight* pages 6–18 to each group.
- Direct students to read their assigned text together and add the relevant details to their T-chart notes on Activity Page 2.1.
- Provide time for groups to share their work after completion. This may be done verbally, using a jigsaw format, or by asking students to write their notes on the class model when ready to do so. Proofread notes before they are shared to avoid errors on the class model.

Challenge

Provide a blank T-chart during "Guided Practice: Taking Notes" and ask the students to find both the central idea and details of their assigned passage.

Activity Page 2.2

Support

Before beginning Activity Page 2.2, direct the students to label the transition words in the word bank with "beginning," "middle," and "end" as applicable.

WRITING WITH TRANSITION WORDS (15 MIN.)

- Tell the students that today's story was about the steps it takes to turn the sun's energy into energy people can use. One way to retell a list of steps is to use transition words. These words will be useful when writing the fuel of the future proposal. Explain that they are going to practice using transition words by retelling how the sun's energy becomes fossil fuel.
- Ask students to turn to Activity Page 2.2.
- Direct the students' attention to the word bank at the top of the page. Tell students that these are some common transition words that are used to tell the order in which something happens. Sequence is another word for order.

Sequence Transition Words			
first	third	then	last
second	next	finally	afterwards

TEKS 4.6.G Evaluate details read to determine key ideas; **TEKS 4.7.E** Interact with sources in meaningful ways such as notetaking, annotating, freewriting, or illustrating.

- Ask the students which word to use for the first step. Direct students to point to that word on their activity page in the word bank.
- Ask students, "What is the first step to the sun's energy becoming a fossil fuel?" First, tell students to turn to a neighbor and share an answer. Then, ask students to share with the class. *(Correct answers should include a reference to the sun shining on plants, plants storing sunlight, or photosynthesis.)*
- Using a think-aloud, refer to the model notes and tell the students, "I see in our class notes that the first step is plants storing the light from the sun using photosynthesis. Let's record that on our papers using the transition word *first*."
- Display the enlarged Activity Page 2.2 and write the sentence "First, plants store the light from the sun using photosynthesis."
- Ask the students, "What transition words might we use for the middle of our sequence?" *(Correct responses include* second, third, next, *and* then.*)*
- Then ask the students what transition words might be used for the last step. *(Correct responses include* finally, last, *and* afterwards.*)*

ARRANGING A SEQUENCE (10 MIN.)

- Direct students to complete Part 1 of Activity Page 2.2. When finished, direct the students to find a nearby partner and complete Part 2 of Activity Page 2.2. Remind the students to use the transition words and their new knowledge from *Buried Sunlight* to complete the exercise. When finished, ask the students to check their partner's work and then hand in the completed page to you or a central location in the classroom.

Check for Understanding

Visit each small group as they work and ask students to share the key ideas and details they have identified and written on their charts. Ask each group to explain why they chose those details.

End Lesson

ENGLISH LANGUAGE LEARNERS

Writing
Using Transition Words

Beginning
Use picture clues from *Buried Sunlight* to accompany the sentences in the partner sequence activity. Ask the student's partner to point to the illustrations that match the sequence sentences before the exchange.

Intermediate
Provide sentence frames for group work.

Advanced/Advanced High
Distinguish the transition word bank word *then* from the word *than*. Explain that these words look and sound very similar but have different meanings and uses.

ELPS 1.E; ELPS 2.E

LESSON

3

The Discovery

PRIMARY FOCUS OF LESSON

Reading

Students will visualize the text as they read to synthesize knowledge about the formation and discovery of oil. TEKS 4.6.D; TEKS 4.6.H

Writing

Students will make and defend claims using supporting evidence from the reading. TEKS 4.9.E.i; TEKS 4.9.E.ii; TEKS 4.12.C

FORMATIVE ASSESSMENT

Activity Page 3.1

Drawing a Diagram Create illustrations with text evidence captions of the events in the Read-Aloud text, "Spindletop Gusher." TEKS 4.6.D

TEKS 4.6.D Create mental images to deepen understanding; **TEKS 4.9.E.i** Recognize characteristics and structures of argumentative text by: identifying the claim; **TEKS 4.6.H** Synthesize information to create new understanding; **TEKS 4.9.E.ii** Explaining how the author has used facts for an argument; **TEKS 4.12.C** Compose argumentative texts, including opinion essays, using genre characteristics and craft.

LESSON AT A GLANCE

	Grouping	Time	Materials
Reading (60 min.)			
Visualizing Spindletop	Whole Group	15 min.	❑ fifty feet of string or yarn ❑ large area such as a gymnasium or playing field ❑ enlarged copy of Read-Aloud text "Spindletop Gusher" ❑ Activity Page 3.1
Guided Visualization	Whole Group	45 min.	
Writing (30 min.)			
Writing and Defending a Claim	Independent	30 min.	❑ Activity Page 3.2

ADVANCE PREPARATION

Reading

- Prepare a piece of string or yarn measuring fifty feet.
- Locate a large area to measure fifty feet using a piece of string. Suggestions include a playing field or gymnasium. If available, a regulation size basketball court, typically measuring fifty feet wide, will work well.

Note: If teaching virtually, instead obtain a paper or digital map of the community and images of the Eiffel Tower and the Golden Gate Bridge.

- Prepare an enlarged copy of "Spindletop Gusher."
- Display the class chart of transitions words from Lesson 2 in an easy to see location for reference during the lesson.

Writing

- Prepare a completed claim statement with key words removed and accompanying words bank for use by beginning ELL students.
- Prepare a list of claim statements for use by intermediate ELL students.

Universal Access

Reading

- Provide a visual reference for one foot and one meter.

Writing

- Seat students next to peers for support during turn and talk activities throughout the lesson.

CORE VOCABULARY

visualize, v. create a mental image

claim, n. a statement that says something is true

evidence, n. information that supports an idea

trenches, n. long holes dug in the ground

derrick, n. a large wooden frame used to support drilling equipment for the extraction of oil

boiler, n. a tank used for heating or holding heated water

rotary drill, n. a tool that works by turning a sharpened bit

bit, n. the part of a tool that cuts, often used in drills

blunt, adj. dull

debris, n. small pieces of scattered material

buggies, n. small, often open top, vehicles pulled by horses

Vocabulary Chart for "The Discovery"		
Vocabulary Type	**Tier 3 Domain-Specific Words**	**Tier 2 General Academic Words**
Core Vocabulary	trenches derrick boiler rotary drill bit debris buggies	visualize evidence claim
Multiple-Meaning Core Vocabulary Words		
Sayings and Phrases		

Lesson 3: The Discovery
Reading

60M

Primary Focus: Students will visualize the text as they read to synthesize knowledge about the formation and discovery of oil. **TEKS 4.6.D; TEKS 4.6.H**

VISUALIZING SPINDLETOP (15 MIN.)

- Ask students if they recall where oil is found, prompting them to think about and synthesize information from "Banana Bread and the Story of Oil" in Lesson 1 and *Buried Sunlight* in Lesson 2. *(Answers may vary but should include oil being found underground.)*
- Tell the students that oil is found very deep underground. Explain that in this story, they will learn that oil is found 311 meters—or 1,020 feet—underground.
- Ask the students how big this is and if it could be compared to something of a similar size. Allow students to share a range of ideas, without reference to how accurate they may be.
- Acknowledge that a size this large is hard to imagine or *visualize*. Tell students that *visualizing* means to imagine a picture in your head.
- Explain that the class is going to measure this distance to help visualize how deep underground the people in today's story had to dig to find oil.
- Lead students to a large area, with as much open space as possible, ideally with fifty contiguous feet (the width of a basketball court). Suggestions include a playing field, long driveway or sidewalk, or gymnasium. Using string or yarn, measure out fifty feet. Tell students that they would need almost twenty and a half more pieces of string to measure the depth of the hole dug to reach the oil underground in today's story. Display the string or yarn in the classroom upon returning as a reference for students while reading the story.

For classes learning virtually, recreate this activity using a paper or digital map and images of famous landmarks, as described in the following directions.

- Show the students a map of a familiar place, such as the school or playing field. Draw a line on the map measuring 1,000 feet (to scale the map). Point out familiar landmarks at the start and end points of the line.

TEKS 4.6.D Create mental images to deepen understanding; **TEKS 4.6.H** Synthesize information to create new understanding.

- Ask the students to think of other examples of objects of distances that measure 1,000 feet. Then, show images of the Eiffel Tower and the Golden Gate Bridge. Explain that 1,000 feet is a little less than the Eiffel Tower (1,060 feet at the tip) and more than the Golden Gate Bridge (745 feet above the water).

GUIDED VISUALIZATION (45 MIN.)

- After returning to the classroom, display an enlarged copy of the text, "Spindletop Gusher."
- Read the story aloud, pausing at the intervals indicated below.
    - After the section labeled "A Dark Surprise" and the phrase "until the fire was extinguished."
    - The section labeled Meanwhile. . . and the phrase "Spindletop was filled with onlookers."
    - The end of the Read-Aloud text, "Spindletop Gusher."
- At each pause, ask the students to first visualize what they see in their minds. Then ask the students to turn to a neighbor and describe their mental image.
- Direct the students to take up to five minutes to sketch their mental image on Activity Page 3.1. Remind students that it is not a detailed drawing and they will have time to add to the sketch later on.
- After reading "Spindletop Gusher," tell the students to add text evidence from the reading below their sketches. Model one example before releasing students to work.
    - Ask students to explain what details in the text helped them visualize, then describe their drawing.
    - Have a student volunteer look in the text to find a detail for their first sketch and read it aloud.
    - Say, "If I had that detail in my sketch, I would copy that sentence in the space below my sketch and the page number I found it on." Write the sentence on the board. "If you had that detail, write that sentence now. If not, find the details that match your sketch. You have space for more than one detail, if needed. Do not forget to include the page numbers."
- After the students have finished the activity page, direct them to hand in their work to you or a central location in the classroom.

Challenge

Tell the students to create an additional set of diagrams showing the formation of oil at Spindletop, including panels that depict how carbon was deposited by living things in the distant past. Remind the students of their work in Lesson 2 with the text *Buried Sunlight*, and make the text available to inform their diagram.

Support

While adding captions to their drawings, have students find and select supporting keywords in the text instead of copying direct text quotes.

Activity Page 3.1

THE SPINDLETOP GUSHER

Show Image 3A-1: The Spindletop Gusher

Hello. I'm Professor Pietro Leo and I'm going to tell you about an incredible discovery that changed the history of Texas: a gigantic black gush that came out of the depths of the earth.

The events took place during the cold winter morning of January 10, 1901, on a small hill called Spindletop, on the outskirts of Beaumont. For years, many people had been unsuccessfully digging the ground of the hill in search of oil.

The Hamill Brothers Arrive at Spindletop

At that time, a group of drillers was working on the hill under the command of two men: brothers Curt and Al Hamill. They had arrived at Spindletop on October 1, 1900, after being hired by the owner of that land, Patillo Higgins. As soon as they got there, they looked for a place to put their equipment. They found an abandoned hut, full of rusty tools among armies of spiders and cockroaches. The men looked at one another. This was better than nothing! They all worked together to clean the hut as best they could because that would be their new home until they finished the job. For how long? No one knew. It all depended on luck.

Once they were settled in, the men got down to work. They dug **trenches** to bring water from a nearby swamp. They built a wooden **derrick** over what would be the future well. That derrick would hold the metal pipes that they would put into the ground as they dug a deep hole. Once the derrick was finished, the men mounted a **boiler** on top of it to power the steam engine that would run their digging tool.

The team planned to use a special tool called a **rotary drill**. Until then, oil had been searched for using a different tool, which did not rotate or turn. It pounded the earth to dig the wells. But the Hamill brothers knew that the rotary drill was best for sandy soils like the one on that hill. The tool consisted of a rotating tube driven by a motor. At the lower end of the tube there was a piece with sharp teeth, called a **bit**. The bit rotated to cut through the sand, rock, and mud in the ground.

The First Attempts

At first, the progress had been slow because the bit would get stuck in the first sandy layers of the ground. The men poured water into the well to carry the sand out, but the sand absorbed much of the water and settled back at the bottom. After twenty days into the job, the team had reached 400 feet deep. But there were still several problems to solve. Sand was still accumulating in the hole. The drill bits were already **blunt**. They had run out of wood to feed the boiler. The men were exhausted and hopeless.

Curt Hamill thought that if they poured mud instead of water into the well, the sand wouldn't absorb it as much, and the mud would help carry it out. The idea worked and the team moved forward. At the end of the year, the men stopped work for a few days to celebrate the holidays with their families. But on January 1, 1901, they were all back.

On the morning of January 10, the drill bit got stuck in a layer of hard rocks. The men removed the tool to change the bit. Once the new one was in place, they put the drill down into the well, which had already reached 700 feet deep. And here's what I wanted to tell you about . . .

A Dark Surprise

When the drill reached the bottom, a strange hissing sound filled the air on the hill. Immediately, a thick column of mud gushed from deep in the earth, carrying with it the very heavy pieces of pipe placed inside the well. The men ran in a hurry, trying to dodge the huge pieces of metal falling from the sky toward their heads! After the mud and the pieces of pipe landed all over the place with a loud noise, the place fell silent. The men slowly and cautiously approached the derrick, ready to run away again if anything else happened.

The first thing they saw was the terrible state of the area around the well. The ground was covered by a thick layer of mud, with huge pieces of pipe sticking out. Shaking their heads, the workers began to remove the **debris** with their shovels. But while they were focused on the task, knee-deep in mud, they felt the ground begin to shake with a deafening roar. Then a gigantic greenish-black jet gushed from inside the hole! What was it? Nothing less than oil!

The immense gush reached 100 feet high above the derrick. The men were covered in oil from head to toe. Dazed, they tried to wipe the oil from their eyes to see what was happening. The first thing they saw, besides the huge black column, was a fire in the boiler they used to activate the drill. The air was filled with the natural gas and oil spewing from the well. If they didn't

put out the fire soon, they all ran the risk of being blown into the air in a loud explosion! So the men began to work to put out the flames until the fire was extinguished.

Meanwhile . . .

What was going on around Spindletop as the drillers worked to put out the fire, and the gush kept going out and roaring nonstop? First, the animals ran away when they heard the loud noise. Farmers watched in awe and terror as the thick black liquid rained down. A carpenter building a barn dropped his tools, mounted his horse, and galloped off to nearby Beaumont to report the news.

The townspeople crowded on the roofs of their houses to catch a sight of the gigantic black column. Hundreds of others wanted to have a closer look and set out immediately, in **buggies** or on horseback, to travel the four miles to the site. Soon, the area around Spindletop was filled with onlookers.

A New Era

The roaring jet that began to gush out at 10:30 a.m. on that cold, clear winter morning continued to flow nonstop for nine days. A sea of oil flowed down the hillside, flooded nearby streams, and covered animals and houses in a black greasy film. The drillers built mud dams to contain the oil. Plows were used to bury the oil-soaked ground to decrease the risk of fire. But nothing was able to fully contain the oil flowing from the well. Workers became ill breathing the oil and fumes that filled the air as they worked. The gusher had to be cut off. Finally, the Hamill brothers succeeded in shutting it off with a risky (but effective) system of pipes and valves.

When silence returned, the men realized what had happened: they had just discovered the largest oil well ever seen up to that time. That "black gold" marked the beginning of a new era in the history of oil, but also in the history of Texas. Why did I use the words black gold to refer to oil? In the next lessons we will be answering this question.

Check for Understanding

During the turn and talk activities, ask students to find their partner's evidence in the text before the partner reveals it.

Lesson 3: The Discovery

Writing

30M

Primary Focus: Students will make and defend claims using supporting evidence from the reading. **TEKS 4.9.E.i; TEKS 4.9.E.ii; TEKS 4.12.C**

WRITING AND DEFENDING A CLAIM (30 MIN.)

- Tell students that when they write a fuel of the future energy proposal they will be arguing that their idea is best. The central idea of that genre, or type of writing, is called a *claim*.
- Explain the concept of a *claim* further by giving an example, such as:

  "If I thought that chocolate ice cream was the best flavor, I might say, '*I claim* that chocolate ice cream is the best possible flavor you could order.'"

- Write the example used on the board and circle the word *claim*.
- Invite the students to share a claim, reminding them to use the sentence starter "I claim that. . ."
- Explain that a claim is different from an idea because it is based on facts. Tell the students that now they will defend claims about what happened in this story. Defending a claim is similar to trying to prove your point is correct. You use facts to support your claim.
- Ask the students to think about the question "Why was there an oil gusher on that day?" Direct the students to turn to a neighbor and share a claim based on fact from the text.
- Write the following sentence starter on the board or chart paper: "I claim the oil gusher occurred because. . ." Direct the students to turn to a neighbor and share their claim again, but this time use the sentence starter on the board.
- Write the following sentence starters on the board: "In fact. . .," "Did you know that. . .," and "For instance, the text says. . ."
- Direct the students to turn to a neighbor and share a fact from the text that supports their claim using one of the posted sentence starters.

TEKS 4.9.E.i Recognize characteristics and structures of argumentative text by: identifying the claim; **TEKS 4.9.E.ii** Explaining how the author has used facts for an argument; **TEKS 4.12.C** Compose argumentative texts, including opinion essays, using genre characteristics and craft.

ENGLISH LANGUAGE LEARNERS

Reading
Visualizing

Beginning
Tell the students to express whether they agree or disagree with their partner's visualization by providing the phrases, "I agree when you say . . ." or "I disagree when you say . . ."

Intermediate
Point to the highlight or underline key words in the text to assist with visualizing.

Advanced/Advanced High
Demonstrate how to find key words in the text by pointing one out in the text and then asking the student to point out another one before continuing to work.

ELPS 1.C; ELPS 1.F; ELPS 3.G

Challenge

Ask students to provide multiple pieces of evidence to support their claim, writing a paragraph instead of a single sentence.

Support

Direct the student to highlight the evidence in the text before copying it onto the activity page.

Activity Page 3.2

ENGLISH LANGUAGE LEARNERS

Writing

Stating a Claim

Beginning

Provide this claim statement with the key words deleted.

I _____ that _____ make the _____ pets.

Ask the student to complete the statement using this word bank of missing key words.

Word Bank:		
best	claim	dogs

Intermediate

Provide a list of claim statements to choose from and then defend using text evidence.

Advanced/Advanced High

Tell the students to use key words from the text in the claim statement.

ELPS 1.E; ELPS 5.B

- Instruct students to practice making a claim by completing number 1 on Activity Page 3.2. Remind the students that they will be writing argumentative essays later on, and these sentence starters will come in handy as writers. Tell the students they may integrate the sentences starters posted in their work if they would like to try writing with them today.
- Ask the students to add text evidence to support their idea. Remind them that this is similar to what they just did with their sketches. They may reuse evidence used in the visualization activity if it matches their claim.
- When finished, share the students' work in small groups or as a whole class.

Check for Understanding

Ask the students to verbally explain why they chose their text evidence for the claim.

End Lesson

LESSON

4

How Did It Happen?

PRIMARY FOCUS OF LESSON

Reading

Students will identify key events in the discovery and drilling of Spindletop using supporting text details. TEKS 4.6.G

Writing

Students will label the introduction, body paragraphs, and conclusion of a teacher model of argumentative text. TEKS 4.9.E.ii

FORMATIVE ASSESSMENT

Activity Page 4.1

Writing Students will retell the events from the Read-Aloud text "The Beginnings of Oil in the United States" including supporting text evidence. TEKS 4.6.G

TEKS 4.6.G Evaluate details read to determine key ideas; **TEKS 4.9.E.ii** Recognize characteristics and structures of argumentative text by: explaining how the author has used facts for an argument.

LESSON AT A GLANCE

	Grouping	Time	Materials
Reading (60 min.)			
Close Reading	Small Group	20 min.	❑ student access to the Read-Aloud texts "Spindletop Gusher" and "The Beginnings of Oil in the United States" ❑ Activity Page 4.1
Presenting Activity Page 4.1	Small Group Whole Group	40 min.	❑ student responses to Activity Page 4.1 ❑ Teacher Resource: Activity Page 4.1 Answer Choice Bank (optional) ❑ materials to create student presentations: • computers with the capability of making a digital slide OR • poster board and markers • images from magazines OR • printed images from online
Writing (30 min.)			
Modeling the Argumentative Essay	Whole Group	20 min.	❑ an enlarged copy of Activity Page 4.2, without labels ❑ Activity pages 4.2, 4.3
Labeling the Argumentative Essay	Partners	10 min.	❑ Teacher Resource: Argumentative Essay Model (Labeled)

ADVANCE PREPARATION

Reading

- Prepare copies of the Read-Aloud texts "Spindletop Gusher" and "The Beginnings of Oil in the United States" for each student.
- Prepare and display an enlarged copy of Activity Page 4.2, without labels, and get markers or highlighters for annotating the model during the lesson. Locate the Argumentative Essay Model (Labeled) to use as an answer key and assist with instruction.
- Seat students so that a neighbor is accessible for Turn and Talk breaks.
- Obtain dictionaries (online or hard copy) for vocabulary support.

Writing

- Pre-label the Activity Page 4.3 for beginning ELL students.
- Prepare a word bank, with and without definitions with the words *claim, introduction, body paragraph*, and *conclusion*.
- Prepare multiple answer choices to the questions assigned to intermediate ELL students.

Universal Access

Reading

- Group students purposefully in heterogeneous or homogeneous groupings, depending on student need.
- Chunk the reading into manageable parts. Direct students to read one part, answer the matching questions before moving on to the next part.
- Make an audio recording of the text or scan digital copies for use with text to voice software available.

Writing

- Provide a word bank containing the parts of the essay during the labeling portion of the lesson.

CORE VOCABULARY

depressions, n. spots lower than the surrounding area

film, n. a very thin layer

extract, v. to pull out or remove

deposit, n. an accumulation of material in one place

flammable, adj. easily set on fire

excavations, n. careful or purposeful digging to uncover something

ambitious, adj. a strong desire to be successful

investor, n. someone who gives money in order to earn more money in the future

compressed, v. squeezed or pressed together

essay, n. a short piece of nonfiction writing

introduction, n. the beginning of a piece of writing

conclusion, n. the ending of a piece of writing

argumentative, adj. a genre of writing

paragraph, n. a group of sentences in a piece of writing that share the same key idea

Vocabulary Chart for "How Did It Happen?"

Vocabulary Type	**Tier 3 Domain-Specific Words**	**Tier 2 General Academic Words**
Core Vocabulary	depressions film extract deposit flammable excavations compressed	ambitious investor introduction conclusion argumentative paragraph essay
Multiple-Meaning Core Vocabulary Words		
Sayings and Phrases		

Start Lesson

Lesson 4: How Did It Happen?

Reading

60M

Primary Focus: Students will identify key events in the discovery and drilling of Spindletop using supporting text details. TEKS 4.6.G

CLOSE READING (20 MIN.)

- Tell the students that today they will learn about the events that lead to the oil gusher we read about in "Spindletop Gusher."
- Assign students to groups of three or four. Direct students to read a copy of "The Beginnings of Oil in the United States" and answer the accompanying comprehension questions on Activity Page 4.1. Explain that for the timeline at the bottom of the page, they may add more events to the timeline than there are printed marks. Students may also choose to complete this on a separate sheet to provide more room. Review with students how to read and use a timeline, as needed.
- When the students complete their work, tell them to hand it in to you or a central location in the classroom.

THE BEGINNINGS OF OIL IN THE UNITED STATES

Show Image 4A-1: The First Oil Well

Do you remember the exciting story of Spindletop and the giant jet of oil that gushed from the ground for nine days straight? Now let's look at why the Spindletop drillers were so determined to find that strange liquid.

The Formation of Oil

Today we know that oil was formed from sea plants and animals that lived millions of years ago. When these living creatures died, they sank to the bottom of the oceans. Over the years, their remains were buried under multiple layers of rock and sand. The decomposition of these remains raised the temperature of the place where they were buried. The high temperatures,

TEKS 4.6.G Evaluate details read to determine key ideas.

Activity Page 1.4

Challenge

Assign the additional critical thinking question to accompany Activity Page 4.1, "Do you consider the events of this chapter a success when weighing all the problems that were created by the oil well gushing into the air?"

Support

Indicate to the students where the information to answer their assigned questions can be found within the text, as seen in the answer key.

combined with the weight of the countless layers that accumulated, caused a chemical reaction that turned the remains into oil. So when the ancient seas dried up, the oil was trapped under tons of earth at great depths.

However, the strange oily liquid seeped through rocks and sand to the earth's surface in small quantities. Sometimes it accumulated in **depressions** in the ground. Other times it floated as an oily **film** on the water of lakes and streams.

Oil in History

Over time, people around the world discovered different ways to use the oil that appeared on the surface of Earth. For example, the ancient Egyptians used it to make their mummies. Centuries later, medieval knights used oil to shine their metal armor. Native Americans used it in the preparation of skin ointments. Later, oil proved useful for sealing cracks in wooden boats. It was also used to grease the wheels of buggies and it was even burned in lamps for light. There was no doubt that oil was very useful. However, until the 19th century, no one knew how to **extract** it from underground.

Lighting was one of the main uses that oil seemed to offer. In the 19th century, the main product used by Americans to light their lamps was whale oil. Gradually, whales became scarce and, consequently, their oil became more and more expensive. As a result, many businesspeople began to think about obtaining oil in larger quantities.

Samuel Kier was an American chemist who owned a salt **deposit** in Titusville, Pennsylvania. One of the nearby streams was leaking oil, which made salt production difficult. Kier decided to study the strange oily and **flammable** compound. After several experiments, he succeeded in refining oil into kerosene, a material that could be used to light lamps without the smoke and odor produced by crude oil. Upon seeing the usefulness and economic potential of the strange black liquid, a businessman named George Bisell partnered with others to found an oil company.

Sprouting Oil

Bisell needed men of action to investigate the sprouting crude oil that was very common in Pennsylvania. He met Edwin Drake, who knew nothing about mining or geology but had a great ability to handle all kinds of tools, possessed a very stubborn character, and liked challenges. Bisell didn't think twice: Drake was the perfect candidate.

Drake began to work in Titusville in early 1858. At first he made small **excavations** in the form of trenches. After several months without results, Drake realized that he had to think of a more **ambitious** project. In mid-1858, he planned to drill a well several meters deep, similar to those made to extract salt. He built a wooden derrick and bought a tool to strike the rock, which was powered by a steam machine. The rotary drill had not been created yet, and his men worked for almost a year with no results. Bisell and his partners decided to stop funding the project. But Drake didn't want to give up. So, with money from his friends and a loan, he kept working to fulfill his dream. No one believed he could make it. But Drake didn't pay attention to the doubts or ridicule of others and continued to work tirelessly.

In August 1859, when the well was 69 feet deep, the drilling crew encountered a strange crack. The next morning, on August 27, Drake and his workers smelled the unmistakable odor of crude oil. They had found the first oil well in history!

After the Discovery

The discovery attracted countless businesspeople who dug hundreds of wells in Pennsylvania, Ohio, West Virginia, and Indiana. Most of the oil was refined into kerosene. While oil was refined, gasoline also appeared in small quantities. But gasoline couldn't be used for lighting because it produced explosions. (No one yet imagined the use it would have many years later.) As a result, most of the gasoline was dumped into lakes and streams near the refineries.

Spindletop Hill

In the 1890s, workers searching for water in Corsicana, Texas, accidentally discovered a small oil deposit. Meanwhile, on the outskirts of Beaumont, another Texas town, a man named Pattillo Higgins became interested in a small hill called Spindletop. Do you remember it? Higgins had noticed that Spindletop was leaking natural gas, and he knew that natural gas and oil are often found in the same place.

One day, he saw a sign advertising land for sale at Spindletop at a very good price: six dollars an acre. He started buying land with the purpose of searching for oil. Higgins had big plans. However, his excavations between 1883 and 1886 were unsuccessful.

When Higgins ran out of money, he posted an ad looking for an **investor**. Only Captain Anthony Lucas responded. After finding a small amount of

oil in 1899, Lucas also ran out of money and went out to look for investors in Pennsylvania. Rockefeller's company turned him down because they didn't believe there was oil in that Texan hill. However, other oil exploration businessmen, Guffrey and Galey, decided to take the risk.

Lucas told them that no one had ever been able to dig wells over 400 feet on Spindletop Hill because of the sandy ground. Back then, a chisel drill was used to search for oil. A chisel drill was a very big tool that was used to drill through the rocks. But that only worked in rocky, hard areas. In sandy ground, the chisel drill just **compressed** the earth. Guffrey and Galey told him not to worry because they knew the Hamill brothers. Do you remember that name? Jim, Al, and Curt Hamill were using a new tool, the rotary drill, to dig wells over 1,200 feet deep. Do you remember how the rotary drill worked? The businessmen called Jim, the oldest of the brothers, who was working at Corsicana, to hire him. Jim sent Al and Curt to take on the new job. And you know what happened next! *What important events do you remember from the previous lesson?*

In the next lesson, we will look at the consequences of these major oil-related discoveries. And very soon you will know what they are!

PRESENTING ACTIVITY PAGE 4.1 (40 MIN.)

- Assign each group a portion of the questions to present to the class, ensuring all questions have been assigned to a group.
- Distribute materials to create a presentation sharing the group's assigned questions. Presentations should include both text and images. Encourage students to create their own images (drawing or collage) based on their visualization of the chapter and supporting text evidence.
- While students work, circulate and monitor the content of their presentations to ensure accurate responses will be shared.
- After the groups have created their presentations, give each group a turn to present their work. Prompt the group that is sharing to include the text evidence they used to support the images in the presentation.
- After each presentation, encourage the students in the audience to ask clarifying questions.

Activity Page 4.2

ENGLISH LANGUAGE LEARNERS

Reading
Reading for Information

Beginning
Allow students to answer questions 7–10 using sketches and oral response.

Intermediate
Provide the bank of answer choices found in the Teacher Resources to choose from when working on the assigned questions.

Advanced/Advanced High
Provide access to a dictionary, or online dictionary resource, to look up unfamiliar vocabulary while reading.

ELPS 4.G

Check for Understanding

As small groups reveal the answers to the comprehension questions, ask the audience to indicate if they agree with the answer using a thumbs up or down. Ask students who disagree to defend their answer.

Lesson 4: How Did It Happen?

Writing

30M

Primary Focus: Students will label the introduction, body paragraphs, and conclusion of a teacher model of argumentative text. TEKS 4.9.E.ii

MODELING THE ARGUMENTATIVE ESSAY (20 MIN.)

- Display the enlarged copy Activity Page 4.2. You will be modeling the parts of an argumentative essay in the following steps. Refer to the labeled model in the Teacher Resources to assist you.
- Tell the students that this is an example of a genre called argumentative writing. Ask the students what familiar word they hear in that name. The students should identify the word argue.
- Explain that in this case, argumentative does not mean fighting; instead, it means defending a central idea or *claim*. Mark this on the class model as shown on Activity Page 4.2.
- Tell the students that you will read the first paragraph, or introduction, to them. Label the introduction on the class model. Ask the students to listen for the central idea or claim that the essay will be defending.

  "On a hot day, there is nothing like an ice cream cone covered in your favorite toppings. When you step up to the counter, the choice is clear. The best flavor of ice cream is chocolate."

- Ask the students to turn to a neighbor and share what they believe is the claim or central idea of this essay. *(Correct responses should include "the best flavor of ice cream is chocolate" or an equivalent.)*

TEKS 4.9.E.ii Recognize characteristics and structures of argumentative text by: explaining how the author has used facts for an argument.

- Highlight or underline the claim on the enlarged model.
- Tell the students that you will now read the first body paragraph. Explain that this is where the writer gives evidence to support or defend the claim we read in the introduction. Mark this on the class model as shown on Activity Page 4.2.

  "To start, chocolate is one of the most popular flavors, not just of ice cream, but all kinds of desserts. Every restaurant has a chocolate treat. Stores are filled with chocolate on holidays like Halloween and Valentine's Day. Chocolate is even known to have some health benefits!"

- Ask the students to turn to a neighbor and share what they believe is evidence the author is using to support or defend the claim in this paragraph and why. *(Correct responses should include"chocolate is one of the most popular flavors" and "chocolate is even known to have some health benefits" or equivalents.)*
- Mark this on the class model as shown on Activity Page 4.2.
- Tell the students that you will now read the second body paragraph. Explain that this is where the writer continues to give evidence to support or defend the claim we read in the introduction. Mark this on the class model as shown on Activity Page 4.2.

  "Some people might say that chocolate ice cream has its downsides. For instance, it can stain your clothing. On the other hand, who doesn't want to see the wonderful memory of that chocolate banana split sundae the next time you wear those shorts? There is no downside to chocolate ice cream that isn't made better by that delicious flavor melting over your tongue."

- Ask the students to turn to a neighbor and share what they believe is evidence the author is using to support or defend the claim in this paragraph and why. *(Correct responses should include "there is no downside to chocolate ice cream that is not made better by that delicious flavor melting over your tongue" or an equivalent.)*
- Explain that you will now read the final paragraph, called the conclusion. Mark this on the class model as shown on Activity Page 4.2.

Challenge

Before labeling in the activity page, give the student a duplicate copy of the student model that has the paragraphs cut apart or jumbled. Ask the student to first reassemble or reorder the paragraphs before labeling.

Support

Highlight sentences of the essay, as seen in the marked teacher model, for the student. Ask the student to label the highlighted portions.

Activity Page 4.3

ENGLISH LANGUAGE LEARNERS

Writing
Using Vocabulary

Beginning
Instead of labeling the essay, ask the student to point out and verbally name each part of the essay on a pre-labeled copy of Activity Page 4.3.

Intermediate
Provide the following word bank with definitions to assist in labeling the essay:

Word Bank:
claim, n. an idea said to be true
essay, n. a short piece of nonfiction writing
introduction, n. the beginning of a piece of writing
conclusion, n. the ending of a piece of writing
argumentative, adj. a genre of writing
paragraph, n. a group of sentences in a piece of writing that share the same central idea

Advanced/Advanced High
Preview the words *introduction*, *body paragraph*, and *conclusion* prior to the start of the lesson.

ELPS 3.F; ELPS 4.D

- Ask the students what familiar word they hear in that name. Students should identify the word *conclude*. Explain that conclude means to finish. This paragraph finishes the argument by reminding the reader of the claim and why it is true, from the writer's point of view.

  "Ice cream is great and chocolate is great, so why don't we put them together? Chocolate ice cream is popular for good reason. It is the best. Chocolate can even be good for your health when added to your diet in small amounts. So the next time the scooper asks what flavor, say chocolate."

- Ask the students to turn and tell their partner where they see the claim and evidence the author has restated in the conclusion. Ask for volunteers to share their findings on the class copy being displayed.

LABELING THE ARGUMENTATIVE ESSAY (10 MIN.)

- Ask students to turn to Activity Page 4.3, the student model argumentative essay. Direct the students to label the model with the help of their partner.

Check for Understanding

While modeling the argumentative essay, ask students to show their answers to the teacher prompts by pointing to the essay before turning to a neighbor during the turn and talk activity.

End Lesson

LESSON

5

Big Changes

PRIMARY FOCUS OF LESSON

Reading

Students will synthesize cause and effect relationships between the discovery of oil and the living and working conditions in the town to reach an understanding of how the boom affected Texan cities. TEKS 4.6.H

Writing

Students will write the introduction paragraph of their argumentative essay that addresses the question, "What are the fuels of the future?" TEKS 4.11.A

FORMATIVE ASSESSMENT

Exit Ticket

Writing Describe one or more effects from the lesson and defend it as a positive or negative event using evidence from the text in the response. TEKS 4.6.H

TEKS 4.6.H Synthesize information to create new understanding; **TEKS 4.11.A** Plan a first draft by selecting a genre for a particular topic, purpose, and audience using a range of strategies such as brainstorming, freewriting, and mapping.

LESSON AT A GLANCE

	Grouping	Time	Materials
Reading (60 min.)			
Review Cause and Effect	Whole Group	20 min.	❑ Activity Page 5.1 ❑ copies of the Read-Aloud text, "Big Changes," for each student ❑ student responses to Activity Page 5.1
Close Reading	Small Group	25 min.	
Discuss the Reading	Whole Group	15 min.	
Writing (30 min.)			
Guided Writing: Introduction	Whole Group Independent	30 min.	❑ chart paper ❑ writing paper or word processor

ADVANCE PREPARATION

Reading

- Prepare copies of the read aloud text for each student.
- Post discussion sentence frames for intermediate ELL students.
- Create small groups of three to five students for shared close reading.

Writing

- Prepare to display Activity Page 4.2.
- Prepare chart paper or a digital whiteboard for model writing. The model should be preserved for students to refer to later.

Universal Access

Reading

- Group students purposefully to provide homogeneous groups for support or heterogeneous groups that provide positive peer models.
- Preview student answers before asking students to share their work.

Writing

- Make word processors and/or wide lined paper available as students write their drafts.

CORE VOCABULARY

speculators, n. investors hoping to make a profit

fumes, n. strong smelling vapor or gas, often emitted from chemicals

polluted, adj. dirty, unclean

scams, n. purposefully deceptive plans or acts

host, v. to receive guests

abundant, adj. to exist in a large amount

Vocabulary Chart for "Big Changes"

Vocabulary Type	**Tier 3 Domain-Specific Words**	**Tier 2 General Academic Words**
Core Vocabulary	speculators polluted	fumes scams host abundant
Multiple-Meaning Core Vocabulary Words		
Sayings and Phrases		

Start Lesson

Lesson 5: Big Changes

Reading

60M

Primary Focus: Students will identify the cause and effect relationships between the discovery of oil and the living and working conditions in the town. TEKS 4.6.H

Activity Page 5.1

Challenge

Provide a blank chart in lieu of Activity Page 5.1. Direct students to check their work using the scaffolding chart provided on Activity Page 5.1.

Support

Provide a bank of correct cause or effect statements to the exercise on Activity Page 5.1 on a separate page. Direct the students to select an appropriate cause or effect from the bank.

REVIEW CAUSE AND EFFECT (20 MIN.)

- Remind students that during the last lesson they read "Spindletop Gusher" and "The Beginnings of Oil in the United States." In those readings the oil workers had many challenges to solve. Ask students to recall and share one of those challenges.
- Draw or display the chart shown below on chart paper or a digital whiteboard. Record the students' contributions in the chart.

Challenges in "Spindletop Gusher" and "The Beginnings of Oil in the United States"

Problem Examples	Cause	Effect
Heavy chisel drills did not go through the sandy ground. The drilling progress was extremely slow.	The sand was only compacted and refilled the hole when removed. Sand and water easily clogged the hole being drilled.	The crew used a rotary drill to coax it into the ground. The crew mixed mud into the hole to help remove the sand.

- Display this completed chart as a model while the students work on Activity Page 5.1

CLOSE READING (25 MIN.)

- In small groups, direct students to read the Read-Aloud text "Big Changes." After reading, direct the students to work together, in groups of three to five students, to complete Activity Page 5.1.

TEKS 4.6.H Synthesize information to create new understanding.

BIG CHANGES

Show Image 5A-1: The Oil Boomtowns

Do you remember the oil well that flooded Spindletop Hill with oil for nine days until the drillers found a way to stop the immense gusher they had discovered? And do you recall that Spindletop Hill was on the outskirts of a quiet Texas town called Beaumont? Today we're going to learn about the great changes that its residents experienced after the discovery of the largest oil well known until then.

Beaumont Wakes Up

In the days and months following that discovery, crowds poured into the sleepy town of Beaumont. Many newcomers were tourists who wanted to visit the hill that had suddenly become famous. The road from Beaumont to Spindletop was filled with buggies and horses carrying hundreds of visitors eager to stroll through the oil-saturated fields. Along with the tourists came businesspeople and **speculators** who wanted to buy the neighboring land. Many men seeking employment also arrived and they were soon hired by the new oil companies. Even men without any experience in drilling had the chance to earn two or three dollars a day: double the pay earned by workers in the rest of the country.

Exploration derricks increased rapidly all over the hill. By the spring of 1901, there were 138 oil wells. Most were concentrated in an area of 15 acres. That is close to 11 football fields with 12 derricks on each field. Walkways made of wooden planks filled the land flooded with mud and oil. The air on the hill was unbreathable due to the greasy mist of oil, the **fumes** from the boilers that powered the drills, and the smoke from the kerosene-fueled lamps. And, to top it all, many workers fainted from breathing in the natural gas that surfaced along with the oil.

More People, More Problems

Until January 1901, when the discovery took place, there were nine thousand people living in Beaumont. But in the three months that followed, that number rose to fifty thousand! Soon there were not enough hotels or rooms to accommodate the growing crowds of newcomers. The exhausted oil well

workers slept in tents and even rented pool tables, store windows, barbers' chairs, or office desks to spend the night.

It was difficult to satisfy the hunger of the crowds that arrived daily in Beaumont. Many cafeterias and food stores remained open through the night. Another problem was providing enough clean drinking water for everyone. Many newcomers got sick from drinking water from **polluted** streams and rivers. In addition, freshwater sources were breeding grounds for mosquitoes, which feasted on the workers who slept in tents or spent the night in the streets. Some of these mosquitoes spread serious diseases, such as malaria.

This led to another problem: health care. Now there weren't enough doctors to treat all the sick and injured people. Inexperienced oil well workers would often get hurt when handling the huge digging tools. Fires, and even explosions, were also frequent. However, none of these terrible conditions reduced the number of trains arriving daily with people from faraway places like Philadelphia or New York.

New Towns

The land that Pattillo Higgins had bought at six dollars an acre a few years earlier was now selling for as much as a million dollars an acre. Many newcomers made fortunes, but many others were left in ruin from land sale **scams**, which were common.

As the opportunities to make money in Beaumont increased, the newcomers multiplied by the thousands. Among them were many honest people, but there were also gamblers and thieves. Street riots were becoming more frequent. The local police couldn't cope with all the calls for help from the neighbors. Beaumont residents were terrified. The sheriff advised them to stay indoors and padlock their doors if they wanted to stay safe.

In the few months following the discovery of the first well, new towns were formed around the well excavations. One of these was Gladys City, which consisted of a group of wooden buildings that included a post office, a newsstand and candy store, a photography studio, and a general store that sold all kinds of goods needed for daily life. There were also bedrooms and cafeterias to **host** and feed the oil drillers. Drilling for oil had increased nonstop after the discovery of 1901. Where once there were only trees and grass, now derricks were growing every day.

Too Much Oil

Prior to 1901, ninety percent of U.S. oil had been produced in the East Coast. But the first Spindletop well went on to produce more oil than all the Pennsylvania wells combined.

By the end of 1901, oil prices had fallen from a dollar a barrel to three cents a barrel. And do you know why? Because there was too much oil available to buy. The main product of oil was kerosene, which was used for lamps. But there weren't enough lamps in the United States to burn the enormous quantities of oil gushing out of Spindletop. New profitable uses for this **abundant** natural resource had to be discovered urgently.

We are out of time for today. But don't worry, I'll be back so that together we can see what those new uses were.

DISCUSS THE READING (15 MIN.)

- In a whole group, ask students to share their answers to Activity Page 5.1. When sharing the State a Claim response at the bottom of Activity Page 5.1, ask students whether they agree or disagree. Encourage students to defend their choice.

Check for Understanding

Designate one side of the room "Cause" and the other side "Effect". In random order, read one problem, cause, or effect from the chart. Ask students to move to the side of the room that matches whether the statement is a cause or effect.

ENGLISH LANGUAGE LEARNERS

Reading
Finding Cause/ Effect Relationships

Beginning
When a student is called during discussion, ask multiple choice questions. For instance, is _____ a cause or an effect?

Intermediate
At the start of reviewing cause and effect, post sentence frames for use during that discussion. Show their location and read these aloud to the students before beginning.

Advanced/Advanced High
At the start of working on Activity Page 5.1, preview the discussion topic by telling the students that the class will be sharing answers when the page has been completed.

ELPS 3.F; ELPS 4.D

Lesson 5: Big Changes

Writing

30M

Primary Focus: Students will write the introduction paragraph of their argumentative essay that addresses the question, "What are the fuels of the future?" **TEKS 4.11.A**

GUIDED WRITING: INTRODUCTION (30 MIN.)

- Display Activity Page 4.2. Ask the students to identify which paragraph is the introduction. *(Students should identify the first paragraph.)*
- Ask students to identify how the paragraph begins. *(Correct responses should include reference to a central idea or claim.)*
- Tell the students that they will be writing an essay that answers the question, "What are the fuels of the future?" Explain that today's demonstration will use the question, "What is the clothing of the future?"
- Using chart paper or a digital projection, demonstrate how to write an introduction paragraph using a think aloud while the writing is being modeled. The following text may be used in this demonstration:

  "Fashion and clothing have changed a great deal over the course of history. It is clear that a photograph is from the past simply by looking at what the subjects are wearing. What will be the clothing of the future? I claim that the clothing of the future will be as high-tech as the gadgets we put in our pockets today."

- Explain that the students will be learning more about oil and other fuels during the unit to help them generate a claim about their topic, what are the fuels of the future? Invite the students to take a few minutes of thinking time to consider what their claim may be.
- Direct students to write a rough draft of an introductory paragraph for their essay. Remind students that they will revise this later on and may even change their claim as they learn more about fuel.

Challenge

Have students exchange paragraphs with another student and give feedback to each other. Direct the students to ask each other, "Did you understand my claim?" and "Did I back up my claim?" Remind the students that yes/no responses are not helpful feedback for their classmates.

Support

Provide the following sentence starters for the introduction paragraph:

I believe that . . .

In my opinion . . .

My claim is . . .

TEKS 4.11.A Plan a first draft by selecting a genre for a particular topic, purpose, and audience using a range of strategies such as brainstorming, freewriting, and mapping.

- After completing the draft of the introductory paragraph, direct students to complete and hand in the following Exit Ticket. This Exit Ticket can be completed on paper, a sticky note, or a notecard.

Exit Ticket

Describe one or more effects from the lesson and defend it as a positive or negative event using evidence from the text in the response.

Check for Understanding

Ask students to underline the claim in their introduction paragraphs.

End Lesson

ENGLISH LANGUAGE LEARNERS

Writing
Writing an Introduction Paragraph

Beginning
Provide the following cloze model of an introductory paragraph as a starting point for writing:

_____ is an important topic. It is important because _____. In fact, did you know _____? That is why I believe _____.

Intermediate
Allow the students to verbally rehearse the paragraph before writing with a partner.

Advanced/Advanced High
Read the student's writing aloud, without any corrections, to the student. Ask the student to identify any areas that did not sound clear as a listener.

ELPS 1.B; ELPS 1.C

LESSON

6

A New Fuel

PRIMARY FOCUS OF LESSON

Reading

Students will use text-based evidence to make inferences about the discovery of oil and predict its resulting innovations. TEKS 4.6.F; TEKS 4.6.C

Writing

Students will take notes from the reading for use in their argumentative essay body paragraphs. TEKS 4.7.E

FORMATIVE ASSESSMENT

Activity Page 6.1

Writing Students will respond to the prompt: "How did the discovery of oil impact the lives of people after the large discovery at Spindletop?" TEKS 4.6.F

TEKS 4.6.F Make inferences and use evidence to support understanding; **TEKS 4.6.C** Make, correct, or confirm predictions using text features, characteristics of genre, and structures; **TEKS 4.7.E** Interact with sources in meaningful ways such as notetaking, annotating, freewriting, or illustrating.

LESSON AT A GLANCE

	Grouping	Time	Materials
Reading (45 min.)			
Close Reading	Small Group	45 min.	❑ copies of "A New Fuel" ❑ Activity Page 6.1
Writing (45 min.)			
Student Research	Whole Group	25 min.	❑ Teacher Resource: blank note-taking T-charts (1–3 per student) ❑ Teacher Resource: model T-chart notes ❑ Model *Buried Sunlight* ❑ T-chart notes from Lesson 2 ❑ research materials to investigate a variety of fuels including fossil fuels and renewable fuels ❑ T-charts with student work from the Student Research segment
Writing a Body Paragraph	Independent	20 min.	

ADVANCE PREPARATION

Reading

- Make copies of "A New Fuel" for each student.
- Arrange small groups of three to five students for close reading.

Writing

- Gather resources, including books, magazines, and online articles and databases regarding energy and fuels. School and local libraries will be the best resources.
    - These materials may take the form of what is available on the subjects of renewable and nonrenewable energy in your classroom, school library, or public library. Materials can range from digital resources such as online databases and reputable websites to traditional materials such as books, magazines, and encyclopedias. Be mindful to make materials varied and text complexity at all levels available to meet the diverse learning needs of your students. Include some materials that include visual supports such as illustrations, photographs, and diagrams. Digital materials may also have audio to accompany them which makes the text accessible to more students. Display the materials so they are organized and easily accessible to students.
- Prepare blank copies of T-charts, found in Teacher Resources, for student note-taking.
- If using the provided model T-chart notes, is recommended that they be handwritten for a more authentic demonstration.
- Prepare sentence frames for intermediate ELL students to use with Activity Page 6.1.

Universal Access

Reading

- Group students purposefully in homogenous groups for additional support or in heterogeneous groups to provide positive peer models.

Writing

- Make electronic copies of note-taking T-charts available for use with voice to text software or browser extensions.

CORE VOCABULARY

innovation, n. the act of creating something new for a purpose

demand, n. an amount of product or service wanted at a certain time

contaminated, adj. soiled or unfit for use

barges, n. large, flat-bottomed ships used to transport goods

modifying, v. changing for a specific purpose

goods, n. products

conveyor belt, n. a thin surface that moves along a looped track for the purpose of transporting an object

synthetic, adj. artificial, not made by nature

Vocabulary Chart for "A New Fuel"

Vocabulary Type	Tier 3 Domain-Specific Words	Tier 2 General Academic Words
Core Vocabulary	contaminated barges conveyor belt	innovation modifying goods synthetic demand
Multiple-Meaning Core Vocabulary Words		
Sayings and Phrases		

Start Lesson

Lesson 6: A New Fuel

Reading

45M

Primary Focus: Students will use text-based evidence to make inferences about the discovery of oil and predict its resulting innovations. **TEKS 4.6.F; TEKS 4.6.C**

Challenge

Ask the students to create and complete an additional counterclaim column on a separate sheet of paper. Refer to Lesson 10 for more information about teaching counterclaims.

Support

Group students in need of support homogeneously and guide the group through additional examples, gradually releasing the students to continue on their own.

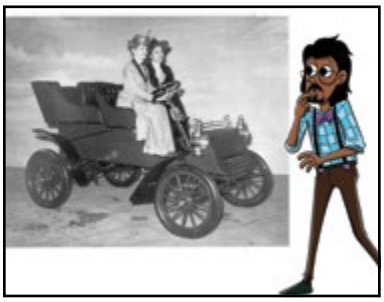
Activity Page 6.1

CLOSE READING (45 MIN.)

- Ask students to recall the problems that arose when extracting the oil from the ground. *(Answers will vary but should include the amount of oil they had collected.)*
- Remind students that this was the first time it was collected in such a large amount.
- Ask students to think about inferences, or conclusions, they can draw about the types of skills the workers needed to extract oil from the ground.
- Tell students that when they are making an inference about the skills that workers needed, they should draw a conclusion from the text about what the workers had to be really good at doing to discover oil.
- Allow students to turn to a partner to make inferences about three skills that the workers needed to discover oil. *(Answers will vary.)*
- Have a few student volunteers share their inferences with the class.
- Tell the students that the text they will read is about how oil led to changes, or innovations in the fueling of machines.
- Tell the students that when we make inferences, or draw conclusions, from our reading, it helps us to make a prediction about the text. Ask the students what a *prediction* is. After hearing responses, explain that a prediction is a guess about what will happen next. Ask the students if they can make a prediction.
- Ask the students to predict what uses for oil may appear in the text. Which uses do you think we still use today?
- Assign the students to groups of three to five. Direct students to read a copy of the text "A New Fuel" and complete the accompanying Activity Page 6.1.
- After the groups have completed their work, shuffle the group's members to create new groups and ask the students to compare their responses to Activity Page 6.1.
- After comparing their work, direct the students to turn in the activity page to you or to a central location in the classroom.

TEKS 4.6.F Make inferences and use evidence to support understanding. **TEKS 4.6.C** Make, correct, or confirm predictions using text features, characteristics of genre, and structures.

A NEW FUEL



Show Image 6A-1: The 1903 Automobile

Do you remember Spindletop? Last time, we saw the great changes that happened in the lives of the local people during the days and months following the discovery of the largest oil well known until then.

Today we're going to look at other changes that took place over time for the people of Beaumont, the rest of the country, and the whole world.

The Oil Industry Grows

During the year following the discovery of Spindletop, the Texas oil industry grew enormously. The United States became the world's major oil producer. Many of the country's most important oil companies were born and grew thanks to this discovery, among them Texaco, the Texas oil company.

As we saw in the previous lesson, the oil extracted from Spindletop wells was more than the **demand** for the main product manufactured at that time with this resource: kerosene to light lamps. And what do you think was done with the oil that wasn't used? It was stored in tanks, which weren't well made and **contaminated** the soil and freshwater sources.

Wooden and metal tanks were built throughout Spindletop Hill to store the oil. Tanks were also built into trains and **barges** to transport the extra oil to be sold across the country. Although it was known that oil could be a good fuel for steam-powered forms of transportation, train and ship engines were still using coal. Do you know why? Because oil was more expensive and it was hard to get.

Changes in Transportation

The first type of transportation to switch from coal to oil were trains in Texas and the southwest. The coal that fueled those trains was bought far away on the East Coast, at very high prices since it had to be transported over hundreds of miles. But the discovery of Spindletop changed this situation greatly. From then on, oil became an abundant, cheap, and local resource in Texas.

The Texas train experiment was so successful that other train companies also made the change from coal to oil. Ship companies that transported **goods** to other regions of the country and the world also joined.

The change from coal to oil didn't require **modifying** the engines. Both train and ship engines were powered by boiling water to make steam. All that was needed was to change the boilers' fuel from coal to oil.

Oil offered great advantages over coal. Coal took up much more space, especially for ships that made long trips. Many men were needed to load the coal onto the ships for several days. Once the coal was on board the ship, other men had to take turns shoveling the coal into the furnaces, where the water for the boilers was boiled. The boiler rooms, located below deck, were very hot places to work!

On the other hand, oil was loaded by a few men in a few hours. Once on board, the oil was stored in tanks. The oil furnaces were also smaller and didn't need shovelers.

The replacement of coal with oil, both on trains and ships, freed up much of the space that was previously used to store fuel and power engines. This was an added advantage for companies, because now there was more room to transport goods and they could make more money.

The Automobile Is Born

The U.S. oil market continued to grow steadily during the early 20th century. New uses for oil spurred new exploration and successful drilling in other parts of the country, but especially in Texas. The oil business was growing, just in time to welcome a new invention: the automobile!

In the late 19th century, many inventors experimented with the use of engines to realize the dream of building a "horseless buggy," that is, a buggy capable of moving on its own.

One of the first automobile manufacturers in the United States was Henry Ford. Ford built a four-wheeled bicycle in 1896, powered by a small engine, but without brakes or reverse gear. In 1903, when his designs had improved, Ford founded his famous automobile company. But his breakthrough came in 1908 with the creation of the Model T.

The Model T, which reached speeds of 25 miles per hour, was the first American automobile built using the assembly line method. The assembly line was a **conveyor belt** with workers stationed at different locations. Each worker performed a specific task and then passed the product to the worker next to them. This made it possible to produce automobiles at a low cost and very quickly. The production of automobiles boosted the U.S. oil industry.

World War I further strengthened the country's oil industry. Many U.S. ships had oil-fueled boilers. Military vehicles and aircraft ran on gasoline too. By the end of the war, the use of automobiles had increased in every city. This led to the construction of highways throughout the country.

However, gasoline wasn't the only important use of oil. Gradually, oil became a necessary material for many other comforts of modern life. The plastic used today to make toys or to package food is also made from crude oil. So are **synthetic** fabrics, such as polyester and nylon. Oil is also used for heating homes, paving roads, waterproofing roofs, and in many other products. Today we have become so used to these and many other comforts that it's difficult to imagine a world without oil.

In the next lesson, we'll see what is happening today with oil and how some people are now using renewable sources of energy instead. Do you want to know what those sources are? I'm sure you'll be interested.

Check for Understanding

Post the definition of *innovation* on the board. Ask students to underline or highlight solutions in the chart on Activity Page 6.1 that could be considered innovations.

ENGLISH LANGUAGE LEARNERS

Reading
Reading for Information

Beginning
Allow the students to draw a diagram of the problem and solution listed on Activity Page 6.1.

Intermediate
Provide the following sentence frame for use with Activity Page 6.1:

People's lives changed because . . .

Advanced/Advanced High
Ask the students to name examples of modern innovations to provide context for the key vocabulary word *innovation*.

ELPS 1.A; ELPS 1.C

Lesson 6: A New Fuel

Writing

45M

Primary Focus: Students will take notes from the reading for use in their argumentative essay body paragraphs. TEKS 4.7.E

STUDENT RESEARCH (25 MIN.)

- Show the students the available research materials. If possible, a library visit or classroom visit from a librarian is recommended. Explain how the materials are organized (by topic, by title, by type of media, etc.), and how to access any digital resources. Post any necessary login information in an easy to access location. Model how to access materials with multi-step directions, such as a library database or password protected website.
- Distribute blank note-taking T-charts. Display the model T-notes from *Buried Sunlight* in Lesson 2. Show the students that they have used these kinds of notes before. Ask the students what is written in each column. *(Correct answers should include the central idea in the left column and details in the right column.)*
- Ask the students what they are looking for as they take notes. The goal is to answer the question, "What are the fuels of the future?" What do you want to know that could help you? *(Answers will vary but should include different types of fuel or energy and details relevant to those central ideas. For instance a student may want to know about machines that generate energy (such as windmills) or what kind of energy powers items in their home. If students have difficulty generating ideas, review a type of energy that has been mentioned in the texts so far. An example includes radiant energy from* Buried Sunlight. *Petroleum from "Banana Bread and The Story of Oil," and oil as mentioned in "Spindletop Gusher," are both examples of fossil fuels. Fossil fuels are used by power plants to produce electricity, in addition to many other uses.)*
- Display the KWL chart started earlier in the unit. Explain that the W stands for wonder. Tell the students that someone might wonder about where oil comes from. They would add that wonder in the form of the question to the chart. It may sound like, "Where does oil come from?"

Challenge

Tell the students to add subheadings in the central idea column of the T-chart notes based on the text being used.

For example, if a student is taking notes on a text about wind power, in addition to that central idea, subheading from the text may include turbines, locations, or energy output.

TEKS 4.7.E Interact with sources in meaningful ways such as notetaking, annotating, freewriting, or illustrating.

- Ask students for questions they wonder about when they think of oil and energy to fill in the W column.
- Tell students that the questions in the Wonder column are the research questions that should guide them in their research.
- Tell the students to research the questions that they believe will support the claim they wrote in their introduction paragraph. Explain that, for example, if the claim was "Hydropower is a fuel of the future," then they might research the locations of rivers or how hydropower plants work.
- Remind students that even if the details they find today do not fit those questions exactly, they can still be written down. They may come in handy later.
- Release the students to browse and take notes. Display the model T-notes from *Buried Sunlight* in Lesson 2 as a reference. Assist students with selecting resources, as needed.

WRITING A BODY PARAGRAPH (20 MIN.)

- Display a page of model notes. Notes that may be used for this demonstration are included as follows:

Central Idea	Details
Zippers	Used on leather jackets in 1925 Popular on kids clothes in the 1930s
Velcro	Called hook and loop fastener A brand name Invented after seeds stuck to inventor's jacket
Dry fabrics	Moisture wicking fabric patented in 1998 Under Armor first to market it Pulls moisture away from the skin Prevents smell Comfy when sweating
Medical sensors	MIT invention Clothing with sensor that tell vital signs like temperature Baby monitors in socks Watch oxygen and breathing

Support

When adding details to the note-taking T-chart, tell the student to copy direct quotes of one sentence or less in length.

ENGLISH LANGUAGE LEARNERS

Writing
Taking Notes

Beginning
Have the student sit with you while you take notes.

Intermediate
Allow students to work with a partner to assist with accessing research materials.

Advanced/Advanced High
Allow students to use a paper or digital dictionary to assist with unfamiliar vocabulary in research materials.

ELPS 3.E

- Demonstrate a think-aloud as you model how to convert pertinent notes into sentences for a body paragraph. Text that may be used in this demonstration is provided as follows:

  "There is so much to learn about the technology in clothing worn today. For example, pants have zippers and shoes close with velcro. These innovations make clothing easier to put on and more comfortable to wear. Some clothing has more advanced technology, like special materials that wick away moisture or contain high-tech features such as speakers or oxygen monitors. It is difficult to predict what the future of apparel technology has in store. Eventually people may carry phones and other gadgets that will be sewn into their clothing."

- Ask the students to look at the notes they have gathered so far. Tell the students to ask themselves, "Do any of these details support my claim?" If so, direct the students to change them into sentences to use in their essay on the back of their T-charts.
- Before ending the lesson, ask who wrote a sentence they are proud of during this activity. Invite students to share their best sentence with the class. After sharing, ask a student volunteer what makes their sentence a strong example. Record characteristics of strong sentences on the whiteboard or chart paper as the students share. Leave this list visible for students to refer to throughout the writing process.

Check for Understanding

After taking notes, ask the students to indicate if they gathered information that supports their claim using a thumbs up, down, or in the middle.

End Lesson

LESSON

7

What's Next?

PRIMARY FOCUS OF LESSON

Reading

Students will identify changes in demand for oil over time. TEKS 4.6.H

Writing

Students will generate research questions and begin taking notes from sources to integrate into their essays. TEKS 4.13.A

FORMATIVE ASSESSMENT

Exit Ticket

Writing Write and submit one of your own research questions. TEKS 4.13.A

TEKS 4.6.H Synthesize information to create new understanding; **TEKS 4.13.A** Generate and clarify questions on a topic for formal and informal inquiry.

LESSON AT A GLANCE

	Grouping	Time	Materials
Reading (30 min.)			
Read-Aloud	Whole Group	15 min.	❏ Read-Aloud text "What's Next?" ❏ KWL chart
Discussing the Read-Aloud	Whole Group	15 min.	
Writing (60 min.)			
Writing Research Questions	Whole Group	10 min.	❏ KWL chart ❏ Activity Page 7.1 ❏ Student Research materials
Student Research	Independent	40 min.	
Adding to the Essay	Independent	10 min.	

ADVANCE PREPARATION

Reading

- Prepare an enlarged copy of "What's Next?" for display while reading.

Writing

- Prepare research materials. If not still in place from Lesson 6, set up your display of research materials for students to use.
- Prepare blank copies of the note-taking T-chart to either display with the research materials or distribute to students directly.

Universal Access

Reading

- Provide a visual of the text, an enlarged display or individual copy, to follow during the reading.

Writing

- Provide access to audio versions of research materials and digital copies of the note-taking T-chart with voice to text software or browser extensions.

CORE VOCABULARY

renew, v. to make new

impermeable, adj. not allowing something to pass through

vertically, adj. in an up and down position

horizontally, ad. in a side to side position

fractured, v. to break

innovative, adj. having the quality of something new created for a purpose

fermentation, v. the chemical breakdown of a substance

biogas, n. a mixture of gases created by the breakdown of organic substances

potential, n. the existence of a possibility

Vocabulary Chart for "What's Next?"

Vocabulary Type	**Tier 3 Domain-Specific Words**	**Tier 2 General Academic Words**
Core Vocabulary	impermeable fractured fermentation biogas	abundant vertically horizontally innovative potential
Multiple-Meaning Core Vocabulary Words		
Sayings and Phrases		

Start Lesson

Lesson 7: What's Next?

Reading

30M

Primary Focus: Students will identify changes in demand for oil over time.

TEKS 4.6.H

Challenge

Encourage students to generate higher order thinking questions with sentences starters such as: "What is the advantage or disadvantage of . . . ? ; What would happen if . . . ?; What is an alternative to . . . ?"

Support

Pause reading between pages and prompt students to restate what they have heard to check for comprehension.

READ-ALOUD (15 MIN.)

- Tell students today's reading tells what happened in the story of oil in the decades following the discovery at Spindletop. Ask the students to listen for new facts that we can add to the KWL chart as the text is being read.
- Read "What's Next?" Stop to discuss at the points listed below.
  - Pause after the first paragraph:
    "What does the name *fossil fuels* mean?" *(Fossil fuels include petroleum (oil), coal, and natural gas. They are the decomposed remains of plants, animals, and other organisms that lived long ago.)*
  - Pause after the second paragraph and ask:
    "What does *renewable* mean and what does it have to do with scientists looking for new sources of energy?" *(Renewable means that the energy comes from a source that is not depleted when used. Scientists are interested in this kind of energy because fossil fuels are not renewable.)*
  - Pause after the section titled "Renewable Energy Sources."
    "What are some examples of renewable energy sources?" *(solar, wind, hydropower, biomass [includes wood and wood waste products, biofuel, municipal solid waste, etc.])* Encourage students to explain how they work in their response.
  - Ask, "What does this tell us about the demand for oil since the discovery at Spindletop?" *(It slowed down significantly.)*
  - Pause after reading the title of the next section and ask:
    "This section is titled "Challenges for the Future". What are some of these challenges? Do you have ideas for solving some of them?"
  - Pause at the end of the section and ask:
    "What is the claim the author is making in this paragraph?" *(Oil will continue to be used until renewable energy becomes inexpensive enough to replace it.)*

TEKS 4.6.H Synthesize information to create new understanding.

WHAT'S NEXT?

Show Image 7A-1: Wind Turbines

Energy

As you may recall, in the previous lesson we learned that energy is very important to our lives. Cars, trucks, airplanes, trains, and buses need energy to run. Cell phones, computers, sound equipment, and televisions are some of the devices we use daily that run on energy. Energy is used to light, heat, and cool homes, schools, or workplaces, and to manufacture all kinds of products, from toothpaste and clothing to sidewalks. Today it's almost impossible to imagine a world without energy!

Fossil Fuels

We also learned that much of the energy we use comes from fossil fuels, such as oil, coal, and natural gas. Fossil fuels are called that because they were formed from the remains of living things that died millions of years ago. Those remains were buried in very deep layers of the planet, under many other layers of earth and rocks that accumulated over time. *Pause after reading this paragraph. Say: "In the previous paragraph, we read that it's almost impossible to imagine a world without energy. This paragraph says that most of the energy we use comes from fossil fuels. So, can we say that there is a high or a low demand for fossil fuels?* (high demand)

There's a limited amount of fossil fuels that are buried underground. Once they run out, we would have to wait millions of years for them to form again. That's why we say that fossil fuel energy is not renewable: we can't **renew** it on our own. Some scientists estimate that the world will run out of fossil fuels in less than a century. That's why there is an interest in developing renewable sources of energy. Today, we're going to talk about this, but first I want to tell you about other things happening today with fossil fuels. *Pause after reading this paragraph. Read the first sentence again and explain the meaning of the word limited: "When we say there is a limited amount of fossil fuels, it means that one day they're going to run out." Then ask: "According to the author, what should we do to solve that problem?"* (develop renewable sources of energy)

The fossil fuels that still exist in the world are very difficult to find and remove from the earth. Much of the oil we have used so far came from abundant deposits, such as Spindletop. Do you remember what a deposit

is? A deposit is a place where minerals or fossils exist naturally. There aren't many large deposits left. Most of the new oil discovered in the world is trapped in layers of almost **impermeable** rocks, which don't let the oil out. Until recently, it was impossible to extract the oil trapped in these rocks.

But this situation changed in the early 21st century, when a new technology was discovered: hydraulic fracturing (or fracking). Hydraulic fracturing involves breaking rocks with the force of water. First, a well is drilled **vertically** until the rocks containing the oil are reached. Then, a hole is drilled **horizontally** along these rocks, and water is injected at high pressure, mixed with sand and chemicals. This is how the rocks are **fractured** to let the trapped oil out. *Ask, "What is hydraulic fracturing used for?"* (It's used to extract the oil that is trapped in rocks.)

Hydraulic fracturing has made it possible to reach and remove major oil deposits discovered in recent years. One of the most important is the Wolfcamp deposit in West Texas because it contains enormous amounts of oil. You already know that even the largest fossil fuel deposits will run out one day. So . . . the time has come to tell you about some of the renewable sources of energy that are being developed!

Renewable Energy Sources

Renewable sources have an endless supply of energy. They are based on natural elements such as sunlight, wind, water, and the breakdown of organic waste (e.g., food scraps). They're also known as clean sources of energy. Using them doesn't require drilling big holes or burning fuel. *Ask: "Taking into account what this paragraph says, what are some advantages of alternative energies over fossil fuels?"* (They are renewable and don't pollute.)

Energy from the sun, or solar energy, is obtained by using special panels—called solar panels—that collect light and heat from the sun during the day. That light and heat are used to generate electricity. This type of energy is ideal for places or during seasons with a lot of sunshine.

Wind energy, or wind power, is generated by machines similar to giant windmills that rotate with the wind. These machines are called wind turbines. The movement of the wind turbines converts energy from the wind into electricity. Wind energy is ideal for places that are very windy for most of the year, such as the coastal areas.

Hydropower, or energy from water, is obtained in various ways. One of the most **innovative** harnesses is the movement of the tides. Tides are movements of the sea that push and pull water towards or away from the coast. Hydropower is produced with turbines similar to those used for wind energy, except that they don't rotate with the wind. They move with the movement of the sea. This energy is used to generate electricity.

Biofuels are another way of generating energy. They are produced by the breakdown of organic waste (animal manure, garden waste, food waste) in the process of **fermentation**. This process takes place in special plants, where, on the one hand, **biogas** is used to produce energy.

Challenges for the Future

All these energy sources have great **potential**, but for now they can't replace fossil fuels. Why? First, because right now they're more expensive than fossil energy sources. Second, some of them can only be used in places close to their source. However, many scientists are working on new technology to produce renewable energy that is cheaper and can be used further away from their source. *Ask, "What argument does the author make in this paragraph?"* (Alternative energies can't yet replace fossil fuels because they're more expensive and harder to obtain.)

Can you imagine a future when you will use renewable sources of energy to light your houses, work with your computers, or drive your electric cars? Wouldn't that be fantastic?

DISCUSSING THE READ-ALOUD (15 MIN.)

- Ask the students to consider what questions this new knowledge brings up. For example, the text says, "The fossil fuels that still exist in the world are increasingly difficult to find and remove from the Earth." In a think-aloud explain that this makes you wonder. Tell students, "A question that comes to mind is, how do they search for new deposits in the Earth?" Ask the students what questions come to their minds.
- Add the students' suggestions to the W column of the chart. Allow time for students to skim the reading and have some thinking time before responding.

ENGLISH LANGUAGE LEARNERS

Speaking and Listening
Finding Cause/ Exchanging Information and Ideas

Beginning
Have students pull out only key words from the text to include in the KWL chart.

Intermediate
When adding a wonder to the KWL chart and referring to the text, prompt the students to reread directly from the text instead of paraphrasing.

Advanced/Advanced High
When the students are contributing to the KWL chart, provide teacher support for paraphrasing by restating the student's idea. "So, what you are saying is . . . ?" (Restate the student's idea, modeling effective paraphrasing.)

ELPS 2.E; ELPS 3.F

Check for Understanding

Tell students to turn and talk with a neighbor to share one research question that was generated from a W item on the class' KWL chart.

Lesson 7: What's Next?

Writing

60M

Primary Focus: Students will generate research questions and begin taking notes from sources to integrate into their essays. TEKS 4.13.A

WRITING RESEARCH QUESTIONS (10 MIN.)

- Remind students that during the last lesson we added to the W column of the KWL chart. Explain that during this lesson they will write their own questions to guide their research.
- Direct the students to look at the notes taken during the last class and ask themselves what else they want to know about the central ideas discovered. What do they need to know to support their claims? In addition, some students may want to adjust their claim based on this new knowledge.
- Tell the students to write the research questions they will use to guide them on the Activity Page 7.1. Remind the students that useful questions will start with "What is . . .?"; "Why . . .?"; or "How . . .?" Ask students to avoid yes/no questions.

STUDENT RESEARCH (40 MIN.)

- Direct students to browse the research materials that you set up in Lesson 6, purposefully, selecting resources that are likely to address the research questions they have selected from the KWL chart and Activity Page 7.1.
- After choosing their selected research materials, tell the students to take notes using the available T-charts. Copies of these may be displayed with the research materials or distributed to students directly.

Challenge

After working for fifteen to twenty minutes browsing research materials and gathering notes, tell the students to look back at their research questions. Ask the students to revise their questions to better match the information they are finding in the materials. The students may choose to make their questions more specific, more general, or add "and why?" to existing questions.

Support

Individually or in a small homogenous group, model changing one of the student's notes into sentences. Then, observe the student convert a note into a sentence before allowing the student to continue independently.

TEKS 4.13.A Generate and clarify questions on a topic for formal and informal inquiry.

- In addition to the Support provided, this is a good time to address students who struggled with note taking in Lesson 2. Depending on how many students need this support, you may choose to use Activity Page 2.1 to review note taking individually or in a small group.

ADDING TO THE ESSAY (10 MIN.)

- Ask students to review the notes they have taken so far. Rewrite facts that support their claim into sentences on the Activity Page 7.1. Then, remind the students that some of them wrote sentences from their T-chart note during the last class (Lesson 6). Tell the students to add those sentences to the essay as well.
- After adding their sentences, direct the students to complete the following Exit Ticket on paper, a sticky note, or notecard. Students should hand in their work when completed to you or a central location in the classroom
    - Share one of your research questions and why you chose it.

Exit Ticket

Write and submit one of your own research questions.

Check for Understanding

Ask students to indicate if the questions they generated support their claim with a thumbs up, down, or in the middle.

End Lesson

Activity Page 7.1

ENGLISH LANGUAGE LEARNERS

Writing
Using Research Questions

Beginning
Tell the students to use illustrated research materials as their first choices for information. Direct the students to add information to their notes based on the images and their captions.

Intermediate
Pair students with a peer and ask them to generate research questions, and take notes from research materials together.

Advanced/Advanced High
Tell the students to share their questions before beginning research. Check the questions to ensure they will not result in yes/no answer or are opinion-based.

ELPS 1.H; ELPS 3.E

LESSON

8

Oil Today

PRIMARY FOCUS OF LESSON

Reading

Students will identify and compare the challenges of early oil workers in "Spindletop Gusher" to modern workers in *Oil Rig Workers.* TEKS 4.6.E

Writing

Students will generate questions and conduct interviews to gather primary source information. TEKS 4.13.D

FORMATIVE ASSESSMENT

Exit Ticket Define and provide an example of primary and secondary sources. TEKS 4.13.D

TEKS 4.6.E Make connections to personal experiences, ideas in other texts, and society; **TEKS 4.13.D** Identify primary and secondary sources.

LESSON AT A GLANCE

	Grouping	Time	Materials
Reading (30 min.)			
Close Reading	Small Group	30 min.	❏ *Oil Rig Workers: Getting the Job Done* by Jill Sherman ❏ Activity Page 8.1
Writing (60 min.)			
Identifying Primary and Secondary Resources	Whole Group	15 min.	❏ Activity Pages 8.2, 8.3
Collecting Primary Sources Information	Independent	45 min.	

ADVANCE PREPARATION

Reading

- Prepare small groups of three to five students for the reading activity.
- Create or find audio of the text to assist struggling readers.

Writing

- Prepare an enlarged copy of the model interview.
- Prepare sentence frames for ELL students.

Universal Access

Reading

- Provide access to an audio copy of the text or preview the text prior to class.

Writing

- Encourage the use of sentence starters such as:
    - What do you know about . . .?
    - Can you tell me more about . . .?

CORE VOCABULARY

primary (source), n. first, information that comes from someone who experienced an event firsthand

secondary (source), n. second, information that was collected from a primary source and was retold by another person

Vocabulary Chart for "Oil Today"		
Vocabulary Type	**Tier 3 Domain-Specific Words**	**Tier 2 General Academic Words**
Core Vocabulary		primary (source) secondary (source)
Multiple-Meaning Core Vocabulary Words		
Sayings and Phrases		

Start Lesson

Lesson 8: Oil Today

Reading

30M

Primary Focus: Students will identify and compare the challenges of early oil workers in "Spindletop Gusher" to modern workers in *Oil Rig Workers*. **TEKS 4.6.E**

Challenge

Ask the students to use text-based evidence to explain why oil workers—past and present—are similar and different.

Support

Read the text with the students in a small homogenous group setting.

ENGLISH LANGUAGE LEARNERS

Reading

Reading for Information

Beginning
Have students read aloud the questions on Activity Page 8.1 to you, monitoring their own oral language production and self-correcting as needed.

Intermediate
Allow the students to read aloud and complete Activity Page 8.1 with a partner. Monitor partner reading for appropriate self-corrections.

Advanced/Advanced High
Invite the students to orally rehearse responses before completing Activity Page 8.1.

ELPS 1.A; ELPS 1.B
ELPS 3.E

CLOSE READING (30 MIN.)

- Ask the students what they remember about the working conditions for oil workers about 100 years ago, like those at Spindletop.
- Tell the students that in today's book they will learn about what oil workers do today.
- In small groups, direct the students to read the text using the following procedure:
  - The student whose birthday is next starts reading one page.
  - After reading the page, the student to the reader's left tells the group what the page was about in their own words.
  - The student who just summarized the page reads the next page.
- After all the pages have been read and summarized, tell the group to work together to complete Activity Page 8.1.

Check for Understanding

Ask students to choose whether they would prefer to be an oil worker in the past or present and why.

TEKS 4.6.E Make connections to personal experiences, ideas in other texts, and society.

Lesson 8: Oil Today

Writing

60M

Primary Focus: Students will generate questions and conduct interviews to gather primary source information. TEKS 4.13.D

IDENTIFYING PRIMARY AND SECONDARY RESOURCES (15 MIN.)

- Direct students to the information about primary and secondary resources at the top of Activity Page 8.2
- Review the definitions of primary and secondary sources and uses for primary and secondary resource information.
- Direct students to practice identifying primary versus secondary sources in the "Practice" section of the Activity Page 8.2. When finished, ask the students to compare their work with a neighbor and then review the correct responses with the whole group. Tell the students to wait to complete the "Try it out!" section until told to do so.

COLLECTING PRIMARY SOURCES INFORMATION (45 MIN.)

- Tell the students that they will collect primary source information, using interviews, as part of their research. Remind students that most people are experts on energy because we all use it. Their classmates, families, even teachers can all be useful sources of primary source information.
- Tell the students that they will collect primary source information to use in their essays by conducting an interview. An interview is when you ask a person questions and collect their answers. You will be interviewing a classmate about energy.
- Tell the students to think about their research questions and ask themselves, "Which one could you find out more from an interview?"
- Point to the KWL chart. Ask the students, "Which of these could you find out more from an interview?"

TEKS 4.13.D Identify primary and secondary sources.

Challenge

Tell the students to write an additional follow-up question for at least one of their interview questions. Explain that you may not get all the information you are looking for from the first question. Provide the following sentence starters to generate ideas:

"How did you first learn about . . . ?"

"Why do you think that about . . . ?"

"Would it change your mind if I told you that . . . ?"

Support

Encourage thinking backwards. Ask the student what kind of answers they are looking for and then reverse engineer the question together. Say to the student:

"What do you want to learn from the interview?" *(For example: I want to learn if this person uses renewable energy.)*

"Pretend the person you are interviewing gave you the exact answer you are looking for, what would they say?" *(For example: I may hope for someone to say "Yes, we have solar panels on our house.")*

"Turn that answer around to form a question." *(For example: Do you use some kind of renewable energy in your home?)*

ENGLISH LANGUAGE LEARNERS

Writing
Generating Interview Questions

Beginning
Provide the following sentence frames to generate interview questions:

What do you know about . . .

Do you use . . . ? Why?

How does . . . work?

Where could I find . . . ?

Intermediate
Give the students sentence frames to generate questions and allow the students to collect written responses from the interview subject or record the interview.

Advanced/Advanced High
Preview the terms *primary* and *secondary*, emphasizing the connections to *first* and *second*. Ask the students to explain the difference between the two.

ELPS 1.C; ELPS 1.E

- Ask the students if they have a research question in mind that could be answered with information from an interview of someone they know. For example, if your friend's claim is about wind power, that is a good person to interview about that topic because they have been researching it. Tell the students to respond with a thumbs up or down.
- Ask for volunteers to share who they might interview to gather more information. When sharing, prompt the students to include what question they are trying to answer through the interview.
- Direct the students to write their interview questions in the "Try it out!" section of the Activity Page 8.2.
- When ready, students should conduct interviews with classmates using Activity Page 8.3. This may also be conducted during Conducting Research in the writing segment of Lesson 9. Some students may choose to bring Activity Page 8.3 home to interview a family member at home.
- At the end of the class, tell the students to complete the following Exit Ticket and hand in their work:
    - Tell the meaning of primary and secondary sources in your own words and give an example of each.

Exit Ticket

Define and provide an example of primary and secondary sources.

Check for Understanding

Label one side of the room as primary and the other as secondary. Hold up or project primary and secondary source information examples. Ask students to move to the side of the room that matches the example.

End Lesson

LESSON

9

New Energy

PRIMARY FOCUS OF LESSON

Reading

Students will compare and contrast the benefits and drawbacks of different forms of energy production. TEKS 4.7.B

Writing

Students will research types of energy sources, starting with those in the article, adding details from interview questions and research notes to the body of the essay. TEKS 4.13.C

FORMATIVE ASSESSMENT

Exit Ticket

Writing

1. How many different sources have you used to take notes, so far?
2. Do you find certain types of sources more useful than others? (circle one) Yes/No (circle one) What makes a source useful for your research?
3. How many facts from your notes have been included in your essay so far? TEKS 4.13.C

TEKS 4.7.B Write responses that demonstrate understanding of texts, including comparing and contrasting ideas across a variety of sources; **TEKS 4.13.C** Identify and gather relevant information from a variety of sources.

LESSON AT A GLANCE

	Grouping	Time	Materials
Reading (55 min.)			
Preview Key Vocabulary	Small Group	5 min.	❑ whiteboard ❑ KWL chart ❑ ReadWorks article: "Energy for Life" ❑ Activity Pages 9.1, 9.2
Close Reading	Independent	30 min.	
Creating a Presentation	Independent	20 min.	
Writing (35 min.)			
Conducting Research	Independent	20 min.	❑ student selected texts ❑ student essay, teacher models ❑ Students' previous work on Activity Page 3.2 ❑ Students' previous work on Activity Page 4.3 ❑ Students' previous work on Activity Page 7.1 ❑ Activity Page 9.3
Writing the Essay	Independent	15 min.	

ADVANCE PREPARATION

Reading

- Display the KWL chart in progress for easy reference during the lesson.
- Provide access to computers and software for creating digital slides, or art supplies for creating poster presentations.
- Obtain images that support the types of energy sources described in the ReadWorks article: solar, wind, and hydropower.
- Plan to use strategic partnering of students as an option for additional support during the "Creating a Presentation" portion of the lesson.

Writing

- Provide continued access to research materials and blank T-charts for taking notes.
- Prepare sentence frames for use when writing paragraphs.

Universal Access

Reading

- Provide computer access to the ReadWorks site which offers audio of the article's text.

Writing

- Provide access to a word processor for drafting text of the essay.

CORE VOCABULARY

generate, v. to create or make

renewable, adj. able to make more of something

nonrenewable, adj. not able to make more of something

dependence, n. the reliance on something

Vocabulary Chart for "New Energy"		
Vocabulary Type	**Tier 3 Domain-Specific Words**	**Tier 2 General Academic Words**
Core Vocabulary		generate renewable nonrenewable dependence
Multiple-Meaning Core Vocabulary Words		
Sayings and Phrases		

Lesson 9: New Energy

Reading

55M

Primary Focus: Students will compare and contrast the benefits and drawbacks of different forms of energy production. **TEKS 4.7.B**

PREVIEW KEY VOCABULARY (5 MIN.)

- Tell the students that they have learned a lot about oil, the fuel that powers many essential things in our lives (refer to KWL chart). Explain that one of the things we know is that oil is a nonrenewable resource. Explain that we will examine the word's parts to decode its meaning.
- Display the following on the board:
  - (non): not / (renewable): able to make more
- Have students unpack the definition of the word by examining the parts of the word.
- Display the definition of *nonrenewable*.
- Tell the students that the article they are going to read today is about renewable sources of energy.
- Ask students what the word *renewable* means.
- Ask students to think about what they just learned about the word *nonrenewable* to help them.
- Display the definition of *renewable*.

CLOSE READING (30 MIN.)

- Direct students to read the ReadWorks article "Energy for Life" individually. Allow five or six minutes for students to read. Audio is also available for this article at ReadWorks.org.
- Preview Comparing Energy Sources: Activity 9.1.
- Tell students that they will be filling in a chart that shows the pros and cons of different types of renewable energy.

TEKS 4.7.B Write responses that demonstrate understanding of texts, including comparing and contrasting ideas across a variety of sources.

- Direct the students to reread the article, making notes about the text-based details needed to complete Activity 9.1.
- Direct students to complete Activity 9.1 using information from the article.

CREATING A PRESENTATION (20 MIN.)

- Tell the students that they will share their argumentative essays by making a fuel of future proposal. Their proposal will be made up of a slide deck (or other hard copy product, depending on accessibility).
- Explain that during this lesson the students will practice by creating a slide that shows what they now know about a source of renewable energy from reading "Energy for Life."
- Place students with their predetermined strategic partner if you have opted to use this strategy for additional support.
- Review the checklist on Activity 9.2
- Explain that the information you collected on Activity 9.1 will be the text of the presentation. Pictures may be cut and pasted into the slides (or drawn for hard copy products).
- As students finish their work, display them around the room to prepare for a museum walk. These trial presentations are the model for the energy proposals students will create later in the unit.
- When most of the students are ready to present, explain that they will practice a museum walk. This will be how they present their final projects later on. Explain that just like in a museum, they will walk around looking at each display. They may talk in quiet museum voices about what they see with their fellow visitors.
- As the students view the displays, circulate with them as a visitor. While standing side-by-side with students at a display, ask them what they find interesting in the display they are viewing. Remind them that if they see a creative idea in their classmate's display, they might choose to use that idea in their "Fuel of the Future" presentation later on.
- After viewing the displays, about ten minutes, move the displays to an unobtrusive area of the classroom where they can still be seen for the students to reference during the remainder of the unit.

Activity Pages 9.1 and 9.2

Challenge

After completing Activity Page 9.1, ask the students to use the classroom research materials to find additional pros and cons of at least two of the four types of energy sources discussed in the ReadWorks article (fossil fuels, solar, wind, and hydropower).

Support

Tell the students to color-code the article energy source (fossil fuels, solar, wind, and hydropower) using highlighters or colored pencils to underline. Direct the students to highlight or underline the first column of Activity Page 9.1 to match the colors used in the article. For example, if the solar energy source is yellow in the article, solar would be yellow on the activity page. Explain to the students that they should use the colors to help place the information in the correct part of the chart.

ENGLISH LANGUAGE LEARNERS

Reading

Reading for Information

Beginning
Provide additional images as visual supports for the article.

Intermediate
Allow the students to read with a partner.

Advanced/Advanced High
Preview the prefixes re- and non- to assist with key vocabulary.

ELPS 3.E; ELPS 4.D

Challenge

Assign additional independent research on renewable energy topics using keywords from the reading as search terms in an online database or library catalogue. The students may integrate this information into their own presentation, if relevant.

Support

Provide the following sentence frames to assist in forming the body paragraphs:

One reason why . . .

Did you know that . . .

_____ is important because . . .

Check for Understanding

Designate one side of the room "Pro" and the other side "Con." Read energy facts from the article and ask students to categorize the fact by choosing a side of the room. Ask students to defend their choice using information from the article.

Lesson 9: New Energy

Writing

35M

Primary Focus: Students will research types of energy, starting with those in the article, adding details from interview questions and research notes to the body of the essay. TEKS 4.13.C

CONDUCTING RESEARCH (20 MIN.)

- Explain to the students that they will continue taking notes using the T-chart format. Encourage the students to begin by taking notes about the energy sources introduced in the article "Energy for Life." Then, tell the students they should continue to take notes from the research materials available in the classroom (library, or other location in which class is taking place).
- Midway through this segment, remind the students that the answers to their interviews from the last class can also be used in their notes. Tell the students that adding primary source information, like from their interviews, is a way to strengthen their essays.
- At the end of the research time, direct the students to put away their research materials, but leave their notes out.

WRITING THE ESSAY (15 MIN.)

- Tell the students to reread their notes and identify useful facts they have collected. Remind them to think about whether each fact supports their claim.
- Some students may want to change their claim based on their new knowledge of renewable fuels. Refer these students back to Activity Page 3.2 to review writing a new claim, as needed.

TEKS 4.13.C Identify and gather relevant information from a variety of sources.

- On Activity Page 7.1, direct students to convert their notes into sentences.
- Some students may have gathered enough details and converted them into sentences to write a body paragraph.
- For students who are ready to begin writing paragraphs, refer them to the class model and the model they labeled on Activity 4.3.
- Remind the students that all the sentences in a paragraph have the same idea.
- Have students group sentences that share the same central idea.
- If enough students are ready to begin at the same time, consider gathering, in a small group to review these guidelines.
- Before ending the class, ask the students to read what they have written so far. Then ask them to compare what they have written to the notes they have taken. Tell the students to highlight or underline in their notes the facts that have been used in their essay so far.
- Tell the students to use what they just highlighted or underlined to complete the Exit Ticket on Activity Page 9.3. Direct the students to hand in this work to you or a central location in the classroom when complete.

Exit Ticket

1. How many different sources have you used to take notes so far?
2. Do you find certain types of sources more useful than others? (circle one) Yes/No (circle one) What makes a source useful for your research?

   _____

3. How many facts from your notes have been included in your essay so far?

   _____

Check for Understanding

Ask students to orally express a detail that supports the claim in their essay.

End Lesson

ENGLISH LANGUAGE LEARNERS

Writing

Writing Paragraphs

Beginning
Have the students read their notes, one at a time. Model the drafting process by restating the note as a sentence for the student's essay, while the student jots it down. After modeling two sentences, switch roles with the student.

Intermediate
Read the student's notes back to the student. After each note is read, ask the student if they would like to use it in their essay. If so, ask which paragraph. Color-code the notes by paragraph (introduction, body paragraph, and conclusion) before telling the students to add those notes to their essay. Highlighting will be the most effective as visual aid when color-coding, but colored underlines will suffice if multiple highlighter colors are not easily accessible.

Advanced/Advanced High
Tell the students to color-code their notes by paragraph (introduction, body paragraph, and conclusion) before adding the notes to the essay.

ELPS 3.E

Activity Page 9.3

LESSON

10

Energy Island, Part 1

PRIMARY FOCUS OF LESSON

Reading

Students will identify the central claim of the argumentative text and the evidence supporting it. TEKS 4.9.E.i; TEKS 4.9.E.ii; TEKS 4.9.E.iii

Writing

Students will take notes and add to their essays, including counterclaim details. TEKS 4.13.C

FORMATIVE ASSESSMENT

Activity Page 10.3

Checklist Students will complete a checklist of argumentative essay features, including an identified claim for their research. TEKS 4.9.E.i

TEKS 4.9.E.i Recognize characteristics and structures of argumentative text by: identifying the claim; **TEKS 4.9.E.ii** Explaining how the author has used facts for an argument; **TEKS 4.9.E.iii** Identifying the intended audience or reader; **TEKS 4.13.C** Identify and gather relevant information from a variety of sources.

LESSON AT A GLANCE

	Grouping	Time	Materials
Reading (45 min.)			
Read-Aloud	Whole Group	15 min.	❏ *Energy Island: How One Community Harnessed the Wind and Changed their World* by Allan Drummond, pp. 1–12 (excluding sidebars) ❏ student (partners) access to Activity Page 10.1
Identifying Claim/Counterclaim	Partners	30 min.	
Writing (45 min.)			
Modeling a Counterclaim	Whole Group	15 min.	❏ Argumentative Essay Model: High Tech Clothing (Teacher Resource) ❏ Activity Pages 10.2 and 10.3 ❏ student selected research materials
Adding to the Essay	Independent	30 min.	

ADVANCE PREPARATION

Reading

- Assign students a partner for completing Activity Page 10.1.
- Prepare access to trade book: *Energy Island* by Allan Drummond, pp. 1–12, for student pairs.

Writing

- Prepare to display the Teacher Resource Argumentative Essay Model: High Tech Clothing.

Universal Access

Reading

- Pair students purposefully to provide peer support.

Writing

- Provide access to audio of research materials or digital materials on a computer with text to voice software or browser extensions.

CORE VOCABULARY

counterclaim, n. an idea meant to disprove a claim

support, v. to provide evidence of truth

defend, v. to protect against

Vocabulary Chart for *Energy Island*, Part 1		
Vocabulary Type	**Tier 3 Domain-Specific Words**	**Tier 2 General Academic Words**
Core Vocabulary		counterclaim support defend
Multiple-Meaning Core Vocabulary Words		
Sayings and Phrases		

Start Lesson

Lesson 10: *Energy Island*, Part 1

Reading

45M

Primary Focus: Students will identify the central claim of the argumentative text and the evidence supporting it. **TEKS 4.9.E.i; TEKS 4.9.E.ii; TEKS 4.9.E.iii**

READ-ALOUD (15 MIN.)

- Tell the students that in today's story they will read about an island that decided to use renewable energy. Some people thought it was a good idea, but not everyone. This book includes a claim (prompt student to recall the definition of claim) and a counterclaim.
- Write on the board:
  - counter = opposite
  - claim = a statement that says something is true
- Ask the students to look at the parts of this word. Ask them what they think each means. After hearing students' ideas, write on the board:
  - Counterclaim, n. an argument against a claim
- Explain that as you read the first part of *Energy Island*, the students should listen for the claim and the counterclaim of the renewable energy argument.
- Read *Energy Island*, pp. 1–12, excluding the sidebars.
- Tell the students that authors think about who their audience is when coming up with a claim so that it is as convincing as possible. Ask, "Who is the author's audience in *Energy Island*?" *(Expected responses include the people on the island or people who did not want to switch to another kind of energy.)*

Activity Page 10.1

IDENTIFYING CLAIM/COUNTERCLAIM (30 MIN.)

- Ask the students to turn to Activity Page 10.1. Explain to the students that they will find the claim and counterclaim used in the story they just read.
- Tell the students that some of the work has already been done for them. Ask the students to share what they see already printed on the page.

TEKS 4.9.E.i Recognize characteristics and structures of argumentative text by: identifying the claim; **TEKS 4.9.E.ii** Explaining how the author has used facts for an argument; **TEKS 4.9.E.iii** Identifying the intended audience or reader.

- Explain that in the first column labeled "Problem" they will find details about the problem being solved in the story. We already know from the page that tankers delivering oil to the island was one cause for the Ministry of Energy to select Samsø to stop using nonrenewable energy. Tell the students that in this section they need to fill in a second cause beside the empty bullet point.
- Ask the students to point to the column labeled "Solution" on their paper. Explain that this section will contain the details about how the island solved the problem—a request from the Ministry of Energy to stop using nonrenewable energy.
- Tell the students that in this section, some of the counterclaims have been given to them, but they need to find the claim. In other words, what does the story's author claim is the solution to ending the island's use of nonrenewable energy?
- Ask the students what they think the claim is, based on what they just heard. Accept all answers, but if they do not include that information in their response on their own, ask the students, "What in the text tells you that?" Then tell the students that they will work with a partner to find the answers in the text and complete the chart on Activity Page 10.1.
- While the students are working, circulate around the room to ensure both students in each partnership are actively engaged with the work and with their partner. Remind the students to refer to the text as they work, even if they are confident they recall the story accurately. Tell the students they should use the text to find and confirm their responses.
- When partners finish the page, ask them to pair up with another set of partners. Explain that their answers should match, but they do not have to be exactly the same, word-for-word. If they find answers that are different, the two sets of partners should return to the text to find the correct answer. If they are still in disagreement, the group should ask for assistance.

Check for Understanding

Ask the students to explain claim and counterclaim in their own words, providing an example of each.

Challenge

Have the students include the page numbers of the book where the claim and counterclaim information was found next to the chart on Activity Page 10.1.

Support

Have the students verbally rehearse the claim and evidence before writing the responses.

ENGLISH LANGUAGE LEARNERS

Reading

Reading for Information

Beginning
Create a bank of correct responses for Activity Page 10.1. Have the students insert answers into Activity Page 10.1 from the bank in a cooperative group.

Intermediate
Pair students to write the page numbers where the correct response can be found next to each box on Activity Page 10.1.

Advanced/Advanced High
Pair the student with a partner and tell them to take turns rereading the text, as needed.

ELPS 3.E; ELPS 3.F

Challenge

Tell the students to generate more than one counterclaim statement (two to four, depending on the speed the student works). After a brief amount of additional research, ask the students to choose a counterclaim option for their essay, one which can be best defended against with the facts the students found.

Activity Page 10.2

Lesson 10: *Energy Island*, Part 1

Writing

45M

Primary Focus: Students will take notes and add to their essays, including counterclaim details. **TEKS 4.13.C**

MODELING A COUNTERCLAIM (15 MIN.)

- Explain that in the article "Energy for Life" the students learned that renewable energy sources have good and bad things about them. In *Energy Island* they saw that when someone presents a claim, others present a counterclaim, or an argument against the central idea.
- Tell the students that strong argumentative essays include facts that support the claim AND facts that defend against any counterclaims.
- Display the Teacher Resource Argumentative Essay Model: High Tech Clothing. Draw the students' attention to the third paragraph containing the counterclaim.
- Explain to students that they have gathered facts that support their fuel of the future claims. Now, they need to make sure they also include a counterclaim paragraph. Read the third paragraph aloud to the students.

  "Technology is not always affordable, especially when it is new. Some may say that high-tech clothing will never become popular because it will be too expensive. However, as technology develops, it usually comes down in price. Worry about ruining expensive, high-tech clothing might also be a downside to consider. The solution is the same. Over time, technology is improved and any delicate clothing innovations will eventually become more durable to help improve sales."
- Point out the counterclaim statements to the students.
  - –Some may say that high-tech clothing will never become popular because it will be too expensive.
  - –Worry about ruining expensive, high-tech clothing might also be a downside to consider.

TEKS 4.13.C Identify and gather relevant information from a variety of sources.

The defense against the counterclaims:

  –However, as technology develops, it usually comes down in price.

  –Over time, technology is improved and any delicate clothing innovations will eventually become more durable to help improve sales.

- Using Activity Page 10.2 and their research notes, direct the students to write a counterclaim for their essays. Tell the students to conduct additional research to gather any necessary information, as needed. Explain that they now know which sources have information on their topic and they can return to those for information that helps them write a counterclaim.
- Tell students that in Lesson 12 they will also be discussing wind and solar sources of energy. If they don't already have information on these in their notes, it should be added today.

ADDING TO THE ESSAY (30 MIN.)

- Direct the students to the Activity Page 10.3. Tell the students to fill in the activity page based on the current status of their essay. Remind students that they are still drafting and may not have everything on the checklist yet. Students will likely be able to add their introduction and two body paragraphs.
  - The students may notice that they have not drafted their conclusion. Tell the students that they will draft this during the next lesson.
- Tell the students to add to their essay based on what is missing from the checklist.
- Direct the students to hand in their work to a central location in the classroom, collect the work from students after they are finished. Alternatively, you can conduct a tableside check of Activity Page 10.3, described as follows:
  - Be mindful that the students will need this page back for the next lesson. It should be reviewed and returned as promptly as possible. One strategy would be a tableside check in which you can check this page at the student's seat rather than collecting and returning the papers.

Check for Understanding

Verbally review each item on the checklist. As you read each item, ask students to give a thumbs up or down to show they have included that in their writing so far. This is an excellent opportunity for students to mark their checklist with the outstanding items for future reference.

End Lesson

Support

Ask the students the following prompts to assist in verbally generating a counterclaim, before recording it on the activity page.

- How could you say the opposite of your claim statement?
- What downsides are there to your claim, even if you do not agree?
- Have you heard of different points of view about your claim? Could one of those be a counterclaim?

ENGLISH LANGUAGE LEARNERS

Writing

Writing

Beginning
Allow the students to dictate the essay text.

Intermediate
Before writing, ask the students to highlight keywords in their notes. Remind the students to integrate those keywords into the essay.

Advanced/Advanced High
Allow students to verbally review what each paragraph should contain before using the Argumentative Essay Checklist.

ELPS 1.E; ELPS 2.E

LESSON

11

Energy Island, Part 2

PRIMARY FOCUS OF LESSON

Reading

Students will infer basic themes supported by text evidence to analyze the text's claim. TEKS 4.8.A

Writing

Students will be modeled and guided through writing a conclusion paragraph. TEKS 4.11.B.i

FORMATIVE ASSESSMENT

Activity Page 11.1

Checklist Students will evaluate their essay development using a revising and editing checklist. TEKS 4.11.B.i

TEKS 4.8.A Infer basic themes supported by text evidence; **TEKS 4.11.B.i** Develop drafts into a focused, structured, and coherent piece of writing by: organizing with purposeful structure, including an introduction, transitions, and a conclusion.

LESSON AT A GLANCE

	Grouping	Time	Materials
Reading (30 min.)			
Close Reading	Whole Group	30 min.	❑ an enlarged chart, as seen on Activity Page 10.1, tracking the claim/counterclaims in *Energy Island* ❑ *Energy Island* by Allan Drummond, pp. 13–31, including the sidebars on pp. 6, 8, 25
Writing (60 min.)			
Completing the Essay	Whole Group	40 min.	❑ Activity Page 4.2 ❑ student work from Activity Page 10.3 ❑ Activity Page 11.1 ❑ Teacher Resource Argumentative Essay Model: High Tech Clothing
Using Revision and Editing Checklists	Independent	20 min.	

ADVANCE PREPARATION

Reading

- Prepare a display of the chart seen on Activity page 10.1 on chart paper or a digital whiteboard, leaving the "Counterclaim" section blank.
- Display the Argumentative Essay Model: High Tech Clothing.
- Post sentence frames for class discussion on the board or other visible location.

Writing

- Continue to Display the Argumentative Essay Model: High Tech Clothing while students work on their own essays.

Universal Access

Reading

- Seat students purposefully to maximize their attention during the read aloud.

Writing

- Provide access to a word processor or voice to text software or browser extension.

CORE VOCABULARY

revise, v. change a piece of writing to improve style, form, and purpose

edit, v. change a piece of writing to correct errors

Vocabulary Chart for *Energy Island*, Part 2		
Vocabulary Type	**Tier 3 Domain-Specific Words**	**Tier 2 General Academic Words**
Core Vocabulary		revise edit
Multiple-Meaning Core Vocabulary Words		
Sayings and Phrases		

Lesson 11: *Energy Island*, Part 2

Reading

30M

Primary Focus: Students will infer basic themes supported by text evidence to analyze the text's claim. **TEKS 4.8.A**

CLOSE READING (30 MIN.)

- Tell the students that today they will finish the story of *Energy Island*. In the last lesson, they heard the book's claim.
- Ask the students to recall the claim. *(The island should convert to renewable power/wind power.)*
- Tell the students that the last page they read introduced some counterclaims, reasons against the claim. Ask the students to listen and see if they can hear them.
- Read pages 11–12.
- Ask the students, "What are some counterclaims to the claim the island should convert to renewable energy?" *(cost, time, prefer the old way—truck—, too much trouble— let others do it—, too old for changes)* Allow students to look back at Activity Page 10.1, as needed.
- Record these counterclaims on the chart as shown.
- Explain that in an argumentative piece of writing, you give evidence that refutes, or disproves, any counterclaims. Ask the students to listen for evidence that disproves the counterclaims (show on the displayed chart) as you listen to the rest of the story.
- Read each page of the story—pausing after each— to record evidence the students observe in a column of the chart being displayed.
- Tell students that as they conduct their research they should look for facts that can be used to disprove the counterclaims they wrote on Activity Page 10.2 during the last class.

TEKS 4.8.A Infer basic themes supported by text evidence.

Check for Understanding

Verbally or in a written form, ask the students to rate the quality of the argument made for wind power on the island of Samsø and support their answer with their knowledge of energy.

Lesson 11: *Energy Island*, Part 2

Writing

60M

Primary Focus: Students will be modeled and guided through writing a conclusion paragraph. **TEKS 4.11.B.i**

COMPLETING THE ESSAY (40 MIN.)

- At this point in the unit, many students will have collected a sufficient amount of details from their research. Begin by asking students to consult their Activity Page 10.3. Ask the students, based on their checkmarks from the last class, what they need to add during class today. Some students will need to add a counterclaim paragraph to strengthen your essay. All students will need to add a concluding paragraph.
- Display the Argumentative Essay Model: High Tech Clothing.
- Draw the students' attention to the last paragraph and ask the students what this part of the essay is called *(conclusion).*
- Explain that the purpose of the conclusion is to restate the claim. Ask the students where they see that in the example. *(The clothing of the future will be high-tech.)*

  "Wouldn't it be exciting not to worry about putting down your smartphone and losing it? Well, in the future you will not need to because it may already be built into your outfit. Tomorrow's fashion innovations will not just make our pants and shoes more comfortable, they will make them more useful. The clothing of the future will be high-tech."

TEKS 4.11.B.i Develop drafts into a focused, structured, and coherent piece of writing by: organizing with purposeful structure, including an introduction, transitions, and a conclusion.

Challenge

Ask the students to think of additional counterclaims that could apply, beyond what is included in the story.

Support

Ask the students to contribute to the discussion based on a specific page of text being displayed.

ENGLISH LANGUAGE LEARNERS

Speaking and Listening
Discussion

Beginning
Ask the students multiple choice questions such as, "Should this go in the 'Claim' or 'Counterclaim' column?"

Intermediate
Post sentence frames for class discussion.

Advanced/Advanced High
Use a visual signal to let the students know they will be called on next to contribute to the class discussion. This will provide adequate time to plan the response.

ELPS 1.D; ELPS 1.F

Challenge

Direct students to exchange their essays and provide feedback based on the Revising and Editing Checklists.

Support

Break the Revising and Editing Checklists into more manageable chunks, assigning one or two items to look for at a time.

ENGLISH LANGUAGE LEARNERS

Writing
Revision

Beginning
Assign a partner to assist with reviewing the essay draft using the checklist.

Intermediate
Mark the end of lines in the essay that contain errors to assist the student in locating them.

Advanced/Advanced High
Review the meaning of revising and editing, asking the students to give a verbal example of each before using the checklists.

ELPS 3.E; ELPS 4.F

Activity Page 11.1

- Explain that in addition to the claim, an effective conclusion will also have sentences meant to remind the reader of the evidence and make a final attempt to sway the reader.
- Direct students to work on their essays, finding and adding details and completing their checklists. Remind students to use the transition words they learned in Lesson 2.

USING REVISION AND EDITING CHECKLISTS (20 MIN.)

- After forty minutes of work, or as a large number of students complete their checklist on Activity Page 10.3, introduce the next steps, revising and editing.
- Explain that after the essay has all its parts, the next step is to improve and correct the draft using Activity Page 11.1.
- Display both checklists. Ask, "What differences do you see between these?" Invite students to make suggestions. If not suggested, tell the students that one way to describe revision is improving your writing and one way to describe editing is fixing your writing. Improving is using your author's voice to make your writing the best it can be. Fixing is correcting any mistakes in your spelling, grammar, and punctuation.
- After you have included everything on your Argumentative Essay Checklist, move on to your Revising and Editing Checklists.
- Direct students to continue working on their essays.
- With five minutes left to work, remind students to revisit the Argumentative Essay Checklist to ensure their writing is complete.
- As the students work, conduct a tableside check (as described in Lesson 10) to review the students' Revising and Editing Checklists. Note the students' progress towards completing their essay within the next few lessons.

Check for Understanding

Review the list of items to check for on the Revising and Editing Checklists. As you read each item, ask the students to indicate if they are clear on what they are looking for in their writing with a thumbs up, down, or in the middle.

End Lesson

LESSON

12

Renewable Energy

PRIMARY FOCUS OF LESSON

Reading

- Students will evaluate details about renewable energy. TEKS 4.6.G

Writing

- Students will revise writing for organization and details. TEKS 4.11.C

FORMATIVE ASSESSMENT

Activity Page 12.2

Checklist Students will identify revisions made to the essay to improve organization and detail clarity. TEKS 4.11.C

TEKS 4.6.G Evaluate details read to determine key ideas; **TEKS 4.11.C** Revise drafts to improve sentence structure and word choice by adding, deleting, combining, and rearranging ideas for coherence and clarity.

LESSON AT A GLANCE

	Grouping	Time	Materials
Reading (45 min.)			
Close Reading	Independent	15 min.	❏ ReadWorks Article: "Clean Energy" ❏ Activity Page 12.1 ❏ chart paper ❏ markers ❏ student work from Activity Page 12.1
Debate	Small Group	30 min.	
Writing (45 min.)			
Revising the Essay	Independent	30 min.	❏ Activity Page 12.2 ❏ access to the student's partner's work on Activity Page 12.2
Partner Feedback	Independent	15 min.	

ADVANCE PREPARATION

Reading

- Label one side of the classroom "Claim" and the other side "Counterclaim." Post a piece of chart paper on both sides. Whiteboard space may also be used.
- Post sentence starters for verbal debate in a location easily visible from both sides of the room.

Writing

- Arrange a partner for beginning ELL students while working on the Activity Page 12.2.

Universal Access

Reading

- Provide access to the audio that accompanies the ReadWorks article: "Clean Energy."

Writing

- Provide access to a digital copy of the Activity Page 12.2 with voice to text software or browser extension.

Lesson 12: Renewable Energy

Reading

45M

Primary Focus: Students will evaluate details about renewable energy. TEKS 4.6.G

CLOSE READING (15 MIN.)

- Direct students to read the ReadWorks article "Clean Energy." As they read, ask students to take notes on Activity Page 12.1.
- While the students are working, the teacher should help individual students or pull together a small group of students who need similar supports to complete this activity page.
- After completing the activity page, tell students to turn to a neighbor and compare notes. Explain that each person's notes will be slightly different, but should contain most of the same information. If the students notice a big difference between their notes and their partner's, discuss why they chose to include that information.
- Before ending this segment of the lesson, ask the whole group to share any information they learned that they found interesting or surprising.

DEBATE (30 MIN.)

- Label one side of the room "Claim" and the other side "Counterclaim." Begin by asking the students, "Suppose you thought that oil is a fuel of the future. How could you state that claim in the form of a sentence?" Invite students to share their ideas.
- Write a sentence frame on chart paper or whiteboard for students to access and use for additional support if needed, such as _____ is a fuel of the future, because _____.
- Write the student-generated statements large enough to see from a distance on a piece of paper or whiteboard. Post it on the claim side of the room.
- Invite students who want to defend this claim to stand on that side of the room. Remind students that this does not need to match the essay they are writing.

Activity Page 12.1

Challenge

Encourage students to make inference statements using facts from their notes during debate.

Support

Allow the students to jot down speaking notes before sharing during the debate.

TEKS 4.6.G Evaluate details read to determine key ideas.

ENGLISH LANGUAGE LEARNERS

Speaking and Listening

Offering and Supporting Opinions

Beginning
Pair with a buddy to participate in the debate together.

Intermediate
Post sentence starters for debate where they are visible from either side of the room.

Advanced/Advanced High
Take a few minutes while the class begins to take notes on the ReadWorks article to preview the debate activity.

ELPS 2.E; ELPS 3.E

- Invite students who would like to make counterclaims to stand on the "Counterclaim" side of the room. Invite students to state their counterclaims. Record these statements on the chart paper or a whiteboard posted on the counterclaim side of the room.
- Invite students on the claim side of the room to defend against those counterclaims.
- Repeat this process for the wind and solar power claims; state a claim, move to the chosen side of the room, state counterclaims, and defend counterclaims.
- Allow and encourage students to refer to their notes on Activity Page 12.1 as they make their cases.

Check for Understanding

Direct students to answer the "Ask Yourself " question at the bottom of Activity Page 12.1, "Does any of the information in this article support your essay's claim or connect to your essay's counterclaim? Why or why not?"

Lesson 12: Renewable Energy

Writing

45M

Primary Focus: Students will revise writing for organization and details.

TEKS 4.11.C

Activity Page 12.2

REVISING THE ESSAY (30 MIN.)

- Ask the students to turn to the checklists on Activity Page 11.1 they used during the last class.
- Direct the students to revisit their work from the last class and add a checkmark next to items on the Activity Page 11.1 that are now complete.
- After updating their checklist, invite the students to trade essays with a partner. Partners should read their classmate's work and complete the Activity Page 12.2.

TEKS 4.11.C Revise drafts to improve sentence structure and word choice by adding, deleting, combining, and rearranging ideas for coherence and clarity.

- Explain that when listing the evidence for the partner's essay, there may not be the same number of pieces of evidence as spaces on the checklist. They should leave lines blank or add lines as needed.

PARTNER FEEDBACK (15 MIN.)

- After returning the essay to the writer, direct students to ask any clarifying questions about the feedback. Remind students that revision is improving our writing. Writing can always be better. Even if both the writer and partner checked off all the items on the list, students should choose three areas to revise during the next class.
- Conduct tableside checks of Activity Page 12.2 while the students work.

Check for Understanding

Ask the students to share their compliments at the bottom of Activity Page 12.2. Ask each volunteer the follow-up question, "What details did you add that earned you that compliment?"

End Lesson

Challenge

Direct the student focus on changes to word choice, selecting specific words to create a reaction in the reader.

Support

Ask the students to highlight or underline the claim and counterclaim in their writing.

ENGLISH LANGUAGE LEARNERS

Writing
Peer Review

Beginning
Allow the students to preview the peer review checklist and discuss it with a partner before reading the partner's essay.

Intermediate
Have the students fill in the checkmarks and provide the rest of the feedback verbally, while the essay's author records it on paper.

Advanced/Advanced High
Have the students refer to the Activity Page 4.2 as a visual aid for help finding parts of the partner's essay.

ELPS 3.H; ELPS 4.D

LESSON

13

Houston Makes a Change

PRIMARY FOCUS OF LESSON

Reading

Students will synthesize textual evidence that supports the passage's main claim. TEKS 4.6.H

Writing

Students will edit essays for English conventions. TEKS 4.11.D

FORMATIVE ASSESSMENT

Activity Page 13.2

Rubric Students will self-evaluate their work using a rubric. TEKS 4.11.D

TEKS 4.6.H Synthesize information to create new understanding; **TEKS 4.11.D** Edit drafts using standard English conventions.

LESSON AT A GLANCE

	Grouping	Time	Materials
Reading (40 min.)			
Close Reading	Independent	10 min.	❏ ReadWorks Passage "Houston Affects the Earth" ❏ Activity Page 13.1
Analyze the Reading	Partner	30 min.	
Writing (50 min.)			
Revising and Editing the Essay	Independent	15 min.	❏ student essays ❏ Peer Feedback from Activity Page 12.2 ❏ Revising and Editing Checklist from Activity Page 11.1 ❏ Activity Page 13.2 ❏ student selected research materials that include images ❏ supplies for capturing digital images (such as a camera app) or methods of obtaining paper images (such as a color printer or magazines for clipping or tracing paper) ❏ access to computers with the ability to create a slide deck or ❏ large format paper or poster board and coloring materials ❏ Teacher Resource: Argumentative Essay Model (Labeled)
Creating the Presentation	Independent	35 min.	

ADVANCE PREPARATION

Reading

- Obtain images that support the comprehension of the ReadWorks article for beginning ELL students. Ideas include images of solar panels, oil refineries, the Houston ship channel, a map of Texas showing where Houston is located, Bike to Work Day, Lake Houston Dam, etc.
- Create sentence starters for intermediate ELL students to use on Activity Page 13.1.

Writing

- Prepare a model, showing students how the teacher would like the presentations set-up. This may be a desk with a model display or diagram displayed on the board.
    - Display the Argumentative Essay Model (Labeled) from Lesson 4 alongside either chart paper or space on a whiteboard for drawing a model presentation layout.
- Gather necessary materials for the students to create their presentations.
    - Necessary materials for student presentations will depend on whether the students will make digital or paper products. For digital products, students will need access to computers with a slide-making program, such as PowerPoint or Google Slides. To create paper products, students will need four pieces of paper, markers, scissors, glue or tape, and access to a printer or magazines that may be cut up.
    - Both digital and paper presentations will need access to images. Ideally, students should have access to a computer and printer to search for and print online images that connect to the students' writing. If that is not possible, students may use images cut from discarded magazines or trace images found in books.
    - Invite students to collect primary source images by taking and bringing in their own pictures. Subjects may include power lines, gas pumps, or examples of alternative energy that can be found in the student's community.

Universal Access

Reading

- Provide audio of the text or Read-Aloud, as needed.

Writing

- Chunk the tasks to create the presentation into smaller pieces with teacher check-ins in between.

Start Lesson

Lesson 13: Houston Makes a Change

Reading

40M

Primary Focus: Students will synthesize textual evidence that supports the passage's main claim. **TEKS 4.6.H**

CLOSE READING (10 MIN.)

- Tell the students that today they will read about a real place in Texas that made some changes to how they use energy, including trying some renewable sources.
- Tell students that they will be synthesizing, or combining the knowledge they have learned in this unit as they read this text closely.
- Instruct students to jot down questions, thoughts, or details from this text that makes them think about other knowledge they have learned in this unit.
- Tell students to underline details in the text that is similar to a detail that they have read in a prior lesson's text, or circle details that makes them think differently about what they have learned in a prior text.
- Finally, tell students that they need to be able to identify and explain the passage's main claim after reading.
- Direct the students to do a first read of the ReadWorks article "Houston Affects the Earth" independently.

ANALYZE THE READING (30 MIN.)

- Allow a few student volunteers to share their synthesis of text evidence and the main claim of the passage.
- Ask the students to preview the questions on Activity Page 13.1
- Partner students to complete Activity Page 13.1. Remind the students to look back and reread the text as needed.

TEKS 4.6.H Synthesize information to create new understanding.

Challenge

Assign the students to conduct independent research into other major cities that have made similar steps to change their energy usage as Houston has done.

Support

Chunk the text by dividing it into shorter portions for the students to read. Tell the students to answer the questions they are able to answer before moving on to the next section of the article.

ENGLISH LANGUAGE LEARNERS

Reading

Reading for Information

Beginning
Provide images to support comprehension of the text.

Intermediate
Provide sentence starters for use on Activity Page 13.1.

Advanced/Advanced High
Encourage verbal rehearsal before writing responses to Activity Page 13.1.

ELPS 4.D

Activity Page 13.1

Check for Understanding

After students have completed the first question on Activity Page 13.1, ask the class to pause their work. Ask the students to share what they wrote as the claim of the article. Then, ask students to share how they wrote the same claim using different words.

Lesson 13: Houston Makes a Change

Writing

50M

Primary Focus: Students will edit essays for English conventions. TEKS 4.11.D

Activity Page 13.2

REVISING AND EDITING THE ESSAY (15 MIN.)

- Remind students that in Lesson 12 they used a revising checklist to check their own work and a partner's work. Today they will improve their essays by making the changes based on that feedback and any other goals they set for themselves.
- Ask the students to turn to Activity Page 13.2. Tell the students that this is another tool they can use to evaluate their work.
- Direct students to make changes using the checklist and rubric. If a student does not believe that changes are needed, repeat from the last lesson, "Remind students that revision is improving our writing. Writing can always be better. Even if both the writer and partner checked off all the items on the list, students should choose three areas to revise during the next class."
- After students have revised their work, direct students to the editing checklist to correct any errors in English language conventions that may have been added in the course of revision.
- While the students are working, conduct tableside checks of Activity Page 13.2. Make note that there is a response for each row. Ask students who have marked developing in any row what their plan is for fixing that part of the essay.

TEKS 4.11.D Edit drafts using standard English conventions.

CREATING THE PRESENTATION (35 MIN.)

- Model how to transfer the text of their essay, breaking it up by paragraphs (introduction, claim, counterclaim, conclusion) onto four slides or pages, respectively.
    - Display the Argumentative Essay Model (Labeled) from Lesson 4.
    - Point to each labeled part of the essay and explain that each paragraph will go on its own slide with pictures that connect to the text in that paragraph.
    - Draw a rectangle representing a slide on the chart paper or whiteboard. Explain that the text from a paragraph would be copied onto the slide as you either copy the text of the paragraph or draw a placeholder like a line onto the rectangle.
    - Tell the students that pictures would be arranged around the text to add visuals that both capture the audience's attention and add extra visual information to the slide. Draw small rectangles on the slide to demonstrate.
    - Tell the students that their slides do not need to be arranged exactly like the model, but they should include the text of their paragraph and accompanying pictures.
- Model how to create a bibliography page.
    - Explain that the last page of the presentation will be a bibliography, or list of sources used for information. Remind the students that as they have been conducting research, they have been recording their sources at the top of their notes. Explain that images must be cited for the same reason words need to be cited. Credit must be given for anything you did not create, text or images.
    - Write the model bibliography entry shown below on chart paper or a whiteboard below the model slide.

	Example
Title	"Clean Energy"
Author	By: ReadWorks.org
Type of Resource	Online article

Challenge

Tell the students to label their images as primary or secondary images in the presentation.

Support

Tell the students which resources to use based on where they will be able to locate images pertinent to the student's essay text. For example, if a student is writing about solar a source of energy, direct the student to resources mainly about solar or radiant energy versus resources that cover a wide range of renewable energy. This will reduce the amount of time the student spends browsing for usable images.

- Give the students directions for creating their presentations.
  - Tell students to copy their paragraphs onto their slides or paper, one paragraph to each page.
  - Show the students what is available to them for obtaining images. This will depend on what materials you have access to based on your advanced preparation for this lesson. Model how to access any online resources, such as logging on to the computer or using login credentials to go online to search images. Set guidelines for using paper resources such as what they may or may not cut apart to capture images.
  - For students creating hard copy products, provide tracing paper to assist in copying challenging images. For students creating digital products, encourage the use of multimedia such as moving GIFs, photographs, or short video clips.
  - Remind the students to include their bibliography on the last page. Tell the students that if they are including a primary source image that they created themselves (such as a picture they took) or information from an interview they conducted, it should still be included in the bibliography with themselves as the photographer or author.

ENGLISH LANGUAGE LEARNERS

Writing
Creating Presentations

Beginning
Allow students to use keywords as captions for images.

Intermediate
Assign a partner to work side by side. Tell the students to ask their partners for help defining words or tasks on the activity page, as needed.

Advanced/Advanced High
Have students orally explain items on the Activity Page 9.2 before beginning.

ELPS 1.C; ELPS 3.E; ELPS 3.F

Check for Understanding

Ask students to share one common error they found while editing as a whole class. If they shared the error with their classmate, use an agreed upon visual signal.

End Lesson

LESSON

14

The Boy Who Harnessed the Wind

PRIMARY FOCUS OF LESSON

Reading

Students will identify cause and effect relationships in the story's plot that lead to the character's solution to the problem. TEKS 4.8.C; TEKS 4.8.D

Writing

Students will use the text of their argument essays to create a multimodal presentation, including primary and secondary source images. TEKS 4.9.F

FORMATIVE ASSESSMENT

Activity Page 14.2

Checklist Students will complete a presentation checklist to assess progress and determine final steps. TEKS 4.9.F

TEKS 4.8.C Analyze plot elements, including the rising action, climax, falling action, and resolution; **TEKS 4.8.D** Explain the influence of the setting, including historical and cultural settings, on the plot; **TEKS 4.9.F** Recognize characteristics of multimodal and digital texts.

LESSON AT A GLANCE

	Grouping	Time	Materials
Reading (45 min.)			
Read-Aloud	Whole Group	15 min.	❑ *The Boy Who Harnessed the Wind* by William Kamkwamba and Bryan Mealer ❑ Activity Page 14.1
Analyzing the Story	Partners	30 min.	
Writing (45 min.)			
Creating the Presentation	Independent	30 min.	❑ Activity Page 14.2
Evaluating the Presentation	Independent	15 min.	

ADVANCE PREPARATION

Reading

- Arrange partners for completing Activity Page 14.1.

Writing

- Arrange partners for completing Activity Page 14.2.

Universal Access

Reading

- Seat students close during the read aloud or provide copies for the students to follow along.
- Prepare to read aloud the trade book *The Boy Who Harnessed the Wind*, by William Kamkwamba and Bryan Mealer. As you preview the book, you may wish to add page numbers and reference the Guided Reading Supports included in this lesson. This trade book does not have numbered pages, but for ease of use, we have referred to page numbers in our materials. We begin with page 1, which is opposite the text "In a small village. . ." and number each page in order after that.

Writing

- Divide the checklist into smaller, more manageable portions with a teacher check-in between portions.

Start Lesson

Lesson 14: *The Boy Who Harnessed the Wind*

Reading

45M

Primary Focus: Students will identify cause and effect relationships in the story's plot that lead to the character's solution to the problem. **TEKS 4.8.C; TEKS 4.8.D**

READ-ALOUD (15 MIN.)

- Tell students that today's story is about a boy from Malawi, a country in Africa, who had an energy problem in his community.
- Direct the students to preview the comprehension questions on Activity Page 14.1. Tell students to listen to this information as they enjoy the story.
- Read *The Boy Who Harnessed the Wind* to the students. Begin on the first page of the story, saving the author's note for the end. As you read, incorporate the following information and Guided Reading Supports:
    - p. 7: "William thinks a lot about magic. What else does he wonder about?" *(Answers will vary but the most accurate answers will reference how things or machines work.)*
    - p. 14: "What does William mean when he says 'electric wind'?" *(Answers may vary, but students should include wind power, turbines, or things like a fan.)*
    - p. 20: "William's village did not have many resources. How did he manage to build his windmill?" *(Answers may vary, but should include gathering supplies from the junkyard, assembling the parts, receiving help from friends and family.)*
    - p. 28 (last page of text): "What do you predict William will build next?"*(Answers may vary, but some students may include a water pump or well.)*

Activity Page 14.1

Challenge

Have students conduct independent research on how to make a homemade wind turbine.

Support

Provide the page numbers where the responses to Activity Page 14.1 can be found. See the answer key for details.

TEKS 4.8.C Analyze plot elements, including the rising action, climax, falling action, and resolution; **TEKS 4.8.D** Explain the influence of the setting, including historical and cultural settings, on the plot.

ENGLISH LANGUAGE LEARNERS

Reading

Reading for Information

Beginning

Point to the illustrations in the book as it is being read. Use prompts, such as "What do you see happening here?" or "What does the face/body language tell you in the picture?" to support comprehension.

Intermediate

Pair up students purposefully to provide language support while completing Activity Page 14.1.

Advanced/Advanced High

Remind the students that they learned about wind turbines earlier in the ReadWorks article from Lesson 12. Help the students make a connection between the wind turbine seen in this text and those seen earlier by recalling facts from that earlier article or looking back at the notes taken on Activity Page 12.1.

ELPS 1.A; ELPS 3.E; ELPS 4.F

ANALYZING THE STORY (30 MIN.)

- Explain that in this story, something happened—a cause—that created a negative effect for the village. Ask the students, "What was the setting of The Boy Who Harnessed the Wind?" *(central Malawi, Africa)*. Ask the students, "How did the setting influence the plot of the story?"(*Answers will vary but may include the dry climate in Malawi caused a lack of water in the village.*) Ask the students, "What happened that affected the village?" (*Correct student responses should include that a drought caused a food shortage.*)
- Explain that the next step in the story was to find a solution to the problem. Ask the students, "What problem was William trying to solve?" *(Correct student responses should include a way to get water to the fields to grow food.)*
- Ask the students for the solution William found for this problem. *(Correct answers should include building a wind turbine and/or creating power to pump water into the fields.)*
- Ask students for ideas about what they could do to help others in their community or school. *(Answers will vary.)*
- In partners, direct the students to Activity Page 14.1. Make the book available for partners who need to revisit the text as they work.
- Direct the students to complete Activity Page 14.1 with a partner. After completing the activity page, ask the partners to compare their work with another pair of students. After completing their work, direct the students to hand in the completed page to you or a central location in the classroom.

Check for Understanding

Ask students to make and explain their claim about wind energy after reading the text.

Lesson 14: *The Boy Who Harnessed the Wind*

Writing

45M

Primary Focus: Students will use the text of their argument essays to create a multimodal presentation, including primary and secondary source images.

TEKS 4.9.F

CREATING THE PRESENTATION (30 MIN.)

- Remind the students that during the last lesson they completed their essays and began turning them into their "Fuel of the Future Energy Proposals."
- Direct students to the presentation checklists on Activity Page 14.2.
- Explain that this is the same checklist they used earlier in the unit. There is one checklist for the author and one for partner feedback.
- Explain that the students should complete the top portion (My Presentation Checklist) first.
- Instruct students to use this time to check for and add anything that is missing from their presentation.
- Direct students to work on their presentations, adding what is needed.

EVALUATING THE PRESENTATION (15 MIN.)

- Remind the students to trade with a partner when they are finished with their presentation. The partner should use the "Partner Checklist" column on Activity Page 14.2 to check that work is complete. After completing their checklist, students should hand in their checklist to you or other central location used for collecting work.
- Circulate around the classroom checking that the student's work is almost ready to be presented during the next class. They will have fifteen minutes to revise their work on the essay and presentation before setting up a museum walk. If students have more than fifteen minutes of work to complete, conference with these students to make plans for completion. This may include modifying the assignment, planning additional work time, or assigning a portion of the work that does not require assistance to be done at home.

Activity Page 14.2

Challenge

Add the item "primary and secondary source images" to the presentation checklist.

Support

Break the checklist into chunks and provide a teacher check-in between pieces.

TEKS 4.9.F Recognize characteristics of multimodal and digital texts.

ENGLISH LANGUAGE LEARNERS

Writing

Peer Review

Beginning
Allow students to complete the checklist collaboratively with your help instead of a peer partner.

Intermediate
Pair students purposefully and direct them to complete the checklists collaboratively instead of trading work.

Advanced/Advanced High
Remind the students that the items on this checklist are the same as those in Lesson 9 and looking back at the previous checklist may help with identifying components of the presentation.

ELPS 1.C; ELPS 3.E

Check for Understanding

Ask the students, "If you had time to add one more thing to your presentation, what would it be and why?" Tell the students to share their answers with their partners.

End Lesson

LESSON

15

What are the fuels of the future?

PRIMARY FOCUS OF LESSON

Writing

Students will make final changes to their presentations. TEKS 4.11.E

Presentation

Students will present their multimodal presentation proposals using a museum walk. TEKS 4.13.H

FORMATIVE ASSESSMENT

Activity Page 15.2

Reflect Students will complete a reflection of their published work. TEKS 4.11.E

TEKS 4.11.E Publish written work for appropriate audiences; **TEKS 4.13.H** Use an appropriate mode of delivery, whether written, oral, or multimodal, to present results.

LESSON AT A GLANCE

	Grouping	Time	Materials
Writing (30 min.)			
Editing the Essay	Independent	15 min.	❏ Activity Page 13.2 ❏ Activity Page 14.2
Editing the Presentation	Independent	15 min.	
Presentation (60 min.)			
Museum Walk	Whole Group	40 min.	❏ Activity Pages 15.1, 15.2 ❏ KWL chart from Lesson 1
Self-Reflection	Independent	15 min.	
Close KWL Chart	Whole Group	5 min.	

ADVANCE PREPARATION

Presentation

- Prepare and post sentence starters for the museum walk feedback form, Activity Page 15.1, Audience Feedback.

Writing

- Arrange partners for completing Activity Page 14.2.

Universal Access

Presentation

- Provide sentence starters for use on the feedback form during the museum walk.

Start Lesson

Lesson 15: What are the fuels of the future?

Writing

30M

Primary Focus: Students will make final changes to their presentations.

TEKS 4.11.E

EDITING THE ESSAY (15 MIN.)

- Direct the students to consult their Activity Page 13.2. Compare it to their essay and make any necessary changes.
- Remind students to hand in their work according to your directions. You may choose to have students hand in their work to a central location in the classroom or collect the work from students yourself.

EDITING THE PRESENTATION (15 MIN.)

- Direct students to consult their Activity Page 14.2. Compare it to their presentation and make any necessary changes.

TEKS 4.11.E Publish written work for appropriate audiences.

Lesson 15: What are the fuels of the future?

Presentation

60M

Primary Focus: Students will present their multimodal presentation proposals using a museum walk. **TEKS 4.13.H**

MUSEUM WALK (40 MIN.)

- Direct students to set up their proposal as a display. Hard copy products should have all parts visible. Students presenting digital products may print out their work, if appropriate, or display the work on a screen.
- At each presentation station, students should have Activity Page 15.1 available for peer feedback. The page may be removed from the Activity Book while being displayed.
- Explain that the museum walk is about celebrating the work, not criticizing it. Remind the students that the feedback is for positive comments only. Write these sentence frames in a place that is visible from where the students are conducting the museum walk.
  - I like the _____ that you included because _____ .
  - I thought it was interesting when you wrote _____ .
  - Your _____ in the presentation look great.
- Tell the students they may use these frames to help them or write their own positive comments.
- To promote an equitable amount of comments for all students, tell the students that if a page is full, they should not add to it. If a page has an empty space for a compliment, add one before moving on to the next exhibit.
- Stagger the starting point of students as they circulate through the exhibits to ensure an even distribution of comments on the feedback forms.
- As students visit the exhibits, they should leave feedback on at least three of their classmates' feedback pages.

Activity Page 15.1

Challenge

Post an additional piece of blank paper at the students' displays. Write a counterclaim statement on the paper in a bubble at the center of the paper. Ask students to defend against that counterclaim, using information found in the display, as they visit the exhibit by adding a bubble to the paper. The result will look similar to a word cloud. Be sure to make the original counterclaim stand out by using markers to distinguish it from the student responses.

Support

Give the students the sentence starters being displayed for Audience Feedback on individual pieces of paper for students to carry with them while viewing their classmates' exhibits. A bookmark or paper strip that can be wrapped around the student's wrist are useful ways to make these prompts portable.

TEKS 4.13.H Use an appropriate mode of delivery, whether written, oral, or multimodal, to present results.

ENGLISH LANGUAGE LEARNERS

Writing

Writing

Beginning
Arrange for a student to jot down the compliments from their group at each exhibit.

Intermediate
Have the students select one sentence frame to use consistently on each Audience Feedback form.

Advanced/Advanced High
Have students verbally rehearse responses before completing the reflection form.

ELPS 1.B; ELPS 3.E

Activity Page 15.2

Check for Understanding

Ask for examples of positive comments before beginning the museum walk.

SELF-REFLECTION (15 MIN.)

- After viewing the exhibits and leaving feedback for at least three classmates, the students should return to their seats (or alternate work space while the presentations are being displayed).
- At their workspace, direct students to complete Activity Page 15.2.
- After completing their reflections, gather the students for a project debrief. Ask the students the following:
  - What was a favorite part of this project?
  - What was challenging about this project?
  - What would you recommend to students working on this project in the future?
- Collect Activity Page 15.2 from the students.

CLOSE KWL CHART (5 MIN.)

- As a whole group, ask the students to share what they now know about energy. Add student contributions to the L column of the KWL chart.

End Lesson

Teacher Resources

Grade 4	Unit 8

Teacher Guide

Grade 4 | Unit 8

Teacher Resources

In this section you will find:

- Argumentative Essay Model: High Tech Clothing
- Blank Note-Taking T-Chart
- Model T-Chart Notes
- Activity Page 4.1 Answer Choice Bank
- Activity Page 4.2 Labeled Argumentative Essay Model
- Digital Exit Ticket Suggested Answers
- Activity Book Answer Key
- Texas Essential Knowledge and Skills

ACTIVITY PAGE 4.2: ARGUMENTATIVE ESSAY MODEL: HIGH TECH CLOTHING

Fashion and clothing have changed a great deal over the course of history. It is clear that a photograph is from the past simply by looking at what the subjects are wearing. What will be the clothing of the future? I claim that the clothing of the future will be as high-tech as the gadgets we put in our pockets today.

The clothing worn today is already full of technology that we take for granted. Pants have zippers and shoes close with velcro. These innovations make clothing easier to put on and more comfortable to wear. Some clothing has more advanced technology like special materials that wick away moisture or contain high-tech features such as speakers or oxygen monitors. Eventually people will carry their phones and other gadgets and will expect them sewn into their clothing.

Technology is not always affordable, especially when it is new. Some may say that high-tech clothing will never become popular because it will be too expensive. However, as technology develops it usually comes down in price. Worry about ruining expensive, high-tech clothing might also be a downside to consider. The solution is the same. Over time technology is improved and any delicate clothing innovations will eventually become more durable to help improve sales.

Wouldn't it be exciting not to worry about putting down your smartphone and losing it? Well, in the future you will not need to because it may already be built into your outfit. Tomorrow's fashion innovations will not just make our pants and shoes more comfortable, they will make them more useful. The clothing of the future will be high-tech.

BLANK NOTE-TAKING T-CHART

Topic/Research Question: _____

Source:

Central Idea	Details

MODEL T-CHART NOTES

Topic/Research Question: _____

Source:

Central Idea	Details
Zippers	Used on leather jackets in 1925 Popular on kids clothes in 1930s
Velcro	Called hook and loop fastener A brand name Invented after seeds stuck to inventor's jacket
Dry fabrics	Moisture wicking fabric patent in 1998 Under Armor first to market it Pull moisture away from the skin Prevent smell Comfy when sweating
Medical sensors	MIT invention Clothing sensor that tell vital signs like temp Baby monitors in socks Watch oxygen and breathing

ACTIVITY PAGE 4.1 ANSWER CHOICE BANK

Each answer found here is in sequential order and matches the answer key. When using this with students, adjust the number of choices to fit the needs of the students, taking care to include the correct answer for the questions assigned.

- Ancient Egyptians used petroleum to prepare mummies for burial.
- Knights used oil to shine their armor, shields, and swords.
- Native Americans used oil in medicine and ointments.
- Oil was used to seal cracks and seams in wooden boats.
- Oil helps wagon wheels turn more easily.
- Petroleum was burned in lamps for light.
- Petroleum was mixed in sand and gravel to pave roads.
- Whale oil was overused and in short supply, making it expensive.
- It was discovered that crude oil could be refined into kerosene.
- There was money to be made in selling oil.
- He knew natural gas could be found in the hill and that natural gas and oil (both fossil fuels) are often found together.
- Jim Hamill was hired to help dig a hole deep enough to extract the oil. He used a rotary drill instead of a chisel drill to dig through the sandy ground.
- A rotary drill cut through the sand instead of compacting it like a chisel drill.
- The mud helped to carry the sand out of the hole, instead the sand falling back in when the drill bit was removed.
- Flammable fumes made the area prone to fire.
- The oil ran into streams and covered the animals, trees, and houses in the area.
- Oil and fumes in the air made it difficult for the crew to work due to a lack of fresh air.
- A barrier of dirt was dug to contain the flow of oil.
- The ground was plowed to remove the flammable dirt.
- A framework was built so that the oil could pass through a pipe. A valve was connected to the pipe to stop the flow of oil.

ARGUMENTATIVE ESSAY MODEL (LABELED)

I Scream for Chocolate Ice Cream

Introduction

On a hot day there is nothing like an ice cream cone covered in your favorite toppings. When you step up the counter the choice is clear. The best flavor of ice cream is chocolate.

Claim

Body Paragraph: Defend the Claim

To start, chocolate is one of the most popular flavors, not just of ice cream, but all kinds of desserts. Every restaurant has a chocolate treat. Stores are filled with chocolate on holidays like Halloween and Valentine's Day. Chocolate is even known to have some health benefits!

Body Paragraph: Counterclaim Defense

Some people might say that chocolate ice cream has its downsides. For instance, it can stain your clothing. On the other hand, who doesn't want to see the wonderful memory of that chocolate banana split sundae the next time you wear those shorts? There is no downside to chocolate ice cream that isn't made better by that delicious flavor melting over your tongue.

Counterclaim

Conclusion

Ice cream is great and chocolate is great, so why don't we put them together? Chocolate ice cream is popular for good reason. It is the best. Ice cream is great and chocolate is great. So why don't we put them together? Chocolate ice cream is popular for good reason. It is the best. Chocolate can even be good for your health when added to your diet in small amounts. So the next time the scooper asks what flavor, say chocolate.

Restate Claim

Digital Exit Ticket Suggested Answers	
QUESTION	ANSWER
Lesson 5	
Describe one or more effects from the lesson and defend it as a positive or negative event using evidence from the text in the response.	Answers will vary
Lesson 7	
Write and submit one of your own research questions.	Answers will vary
Lesson 8	
Define and provide an example of primary and secondary sources.	Answers will vary
Lesson 9	
1. How many different sources have you used to take notes, so far? 2. Do you find certain types of sources more useful than others? (circle one) Yes/No (circle one) What makes a source useful for your research? 3. How many facts from your notes have been included in your essay so far?	Answers will vary

ACTIVITY BOOK ANSWER KEY

NAME: _____

DATE: _____

1.1 Activity Page

Modern Inventions Make Life Easier

Directions: Think about the machines and inventions you use 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	Health and Medicine	Food	Transportation
telephone	*x-ray machine*	*stove*	*trains*
Answers may vary.			

Other

Answers may vary.

NAME: _____

DATE: _____

1.2 Activity Page

Vocabulary

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

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

fuel, n. substances, such as food, that are used to give the body energy

fuel, v. to supply power or energy
Example: fuel an argument

energy, n. power needed to run a machine

energy, n. power needed for physical activity

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. substances that can be burned as a source of energy
Breakfast is your **fuel** for the day.	• **oil,** n. slippery liquid made from petroleum used for fuel
My first goal **fueled** my victory.	• **energy,** n. power needed for physical activity
The battery was too low on **energy** to turn on the toy.	• **fuel,** n. substances, such as food, that are used to give the body energy
By the end of the day my body is out of **energy**.	• **energy,** n. power needed to run a machine

NAME: _____

DATE: _____

1.4 Activity Page

Sorting Organizer

Directions:

Brainstorm with your group, "What inventions in everyday life need fuel to run?" Write your group's ideas in the space below.

Responses may vary.

Sort your ideas by type of fuel. Rewrite the ideas in the box above into the chart below using the categories listed. Use the blank column for a type of fuel not already listed, if needed.

Fossil Fuels (gasoline, heating oil, propane)	**Batteries**	**Wind Power**	**Solar Power**	
Responses may vary.				

NAME: _____

DATE: _____

1.5 Activity Page

Lesson 1: Think About It

Directions: Using what you learned in this lesson, answer the prompt below in complete sentences.

Name three important uses of energy in your daily life.

Responses may vary, but should be in complete sentences with correct start of sentence capitalization and end of sentence punctuation.

NAME: _____

DATE: _____

2.1 Activity Page

T-Chart Notes

Buried Sunlight

Central Idea	Details
The Sun's Energy	Answers may vary but could include: • comes from far away • gives light and life to Earth • need sun's energy to stay alive and grow • use energy for heat, cooking, transportation, machines
Where does the sun's energy come from?	Answers may vary but could include: • buried underground • called fossil fuels • ancient plants captured light energy using photosynthesis
Cycle of Life	Answers may vary but could include: • people (animals) eat stored carbon. • breathe oxygen from plants • plants make extra carbon and oxygen. • extra amounts create oxygen to breath and fossil fuels
Fossil Fuels	Answers may vary but could include: • stayed underground for a very long time • took millions of years to create • people burn fuel. • coal • oil • gas

NAME: _____

DATE: _____

2.2 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 *Buried Sunlight* and your notes from *Buried Sunlight* T-chart notes, Activity Page 2.1 to help you.

Answers may vary but should include:

• a logical sequence of steps,

• a transition word from the word bank at the start of each step,

• transition words used in a logical order (for example, *then* should not be used).

Part 2: Rewrite your sentences as directed by your teacher. Mix up the order of your sentences and exchange them with a partner. Can you put your partner's sentences back in the right order using their transition words?

Students may write their sentences on this page and cut them apart or use another material such as sticky notes or notecards.

Sentences that have been rearranged into the correct order should match the original order created by the student's partner or correct any errors made, as needed.

NAME: _____

DATE: _____

3.1 Activity Page

Visualizing: Stop and Sketch

Directions:

Part 1: Listen as your teacher reads the text. Imagine what you are hearing as pictures in your mind. At each pause in the text, stop and sketch what you visualized.

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:

Answers may vary but should include quoted or paraphrased text that matches the illustration with a page number.

NAME: _____

DATE: _____

3.2 Activity Page

Make a Claim

Example:

I claim that chocolate ice cream is the best flavor ever. It is the best because chocolate and ice cream are two great desserts and together make the best ice cream choice.

Directions: Make two claims about the events in the text you read. Defend your claim with evidence from the text.

1. I claim that _____

because _____

2. I claim that _____

because _____

Answers may vary but should include an opinion-based claim statement and supporting details.

NAME: _____

DATE: _____

4.1 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?
   Answers may vary but should include specific evidence as found in the "Oil in History" section of "The Beginnings of Oil in the United States."
2. What was the problem with using whale oil for light in the nineteenth century?
   Whale oil was overused and in short supply, making it expensive. ("Oil in History" from "The Beginnings of Oil in the United States.")
3. What solution was found to solve the problem with affordable lighting fuel?
   It was discovered that crude oil could be refined into kerosene. ("Oil in History" from "The Beginnings of Oil in the United States.")
4. After Edwin Drake drilled an oil well in 1859, why were hundreds more wells drilled throughout the country?
   There was money to be made in selling oil. ("Oil in History" from "The Beginnings of Oil in the United States.")
5. Why did Patillo Higgins suspect that he would find oil in the small hill outside of Beaumont, Texas?
   He knew natural gas could be found in the hill and that natural gas and oil (both fossil fuels) are often found together. ("Spindletop Hill" section of "The Beginnings of Oil in the United States.")
6. What problem was Jim Hamill hired to solve? How did he solve it?
   Jim Hamill was hired to help drip a hole deep enough to extract the oil. He used a rotary drill instead of a chisel drill to dig through the sandy ground. ("Spindletop Hill" section of "The Beginnings of Oil in the United States.")

7. Why was the rotary drill a successful tool at Spindletop?
   A rotary drill cut through the sand instead of compacting it like a chisel drill. ("Spindletop Hill" section of "The Beginnings of Oil in the United States.")
8. How did adding mud to the hole help the crew dig?
   The mud helped to carry the sand out of the hole, instead the sand falling back in when the drill bit was removed. ("The First Attempts" section of "Spindletop Gusher")
9. Success at the oil well also created some problems. What problems were created after the oil well blew out?
   Flammable fumes made the area prone to fire.
   The oil ran into streams and covered the animals, trees, and houses in the area.
   Oil and fumes in the air made it difficult for the crew to work due to a lack of fresh air. ("A New Era" section of "Spindletop Gusher")
10. What were the crew's solutions to those problems?
    A barrier of dirt was dug to contain the flow of oil.
    The ground was plowed to remove the flammable dirt.
    A risky but effective system of valves and pipes were built by the workers. ("A New Era" section of "Spindletop Gusher")

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

Higgins buys the land

page #

Responses may vary but should be in an accurate sequence.

NAME: _____

DATE: _____

4.3 Activity Page

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 4.2 to help you.

Introduction

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.

Claim statement

Body Paragraphs

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.

Details defending the claim

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 dogs that have hair instead of fur and are great for people who get the sniffles from other furry pets like cats.

Counterclaims

Conclusion

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 everyday. Dogs are by far the best pets.

Claim restated

NAME: _____

DATE: _____

5.1 Activity Page

"Big Changes"

Directions: Read "Big Changes." Notice how the extraction of oil caused several effects in the town of Beaumont. Complete the chart below to retell some of these cause-effect events.

Cause	Effect
Fumes were in the air.	Workers passed out frequently.
There was not enough housing for the 41,000 new people in Beaumont.	People were forced to use makeshift shelters.
There was an immense demand for food and supplies.	Grocery stores were open all night.
There was not enough fresh water.	People became ill from drinking dirty water.
There were not enough doctors.	There was little medical attention.
Flammable fumes were in the air.	Fires broke out often.
Many people came to the area with lots of money.	Many new business deals were made, some honest, some dishonest.

State a Claim

Overall, was the boom in Beaumont a positive experience for the town?

Answers may vary but should include a clear claim statement with supporting evidence from the text.

NAME: _____

DATE: _____

6.1 Activity Page

"A New Fuel"

Directions: Read "A New Fuel" and consider the challenges being faced for the new oil industry. Using the chart below, record how the problems occurred and the solutions that solved them. Use the example to help you.

Problem		Solution
Cause	Effect	Claim
A large amount of oil gushed from the ground.	Oil flooded the area and caused hazardous conditions.	The workers created a pipe with a valve to cap the oil well.
Answers will vary but should include 1–3 additional entries in each column.		

Think About It

After discovering such a large amount of oil at Spindletop, how were the lives of everyday people across the country impacted?

Answers may vary but should include information about transportation.

NAME: _____

DATE: _____

8.1 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?	Answers may vary but should include information from the correct text to support answers.	
What are the dangers of working near an oil well?		

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: _____

8.2 Activity Page

Primary and Secondary Sources

When researchers are collecting information they often use primary sources. A primary source is a person who knows about a topic firsthand. They are either an expert on a subject or a witness to an event. These sources are useful because they are very accurate.

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

Information or Event → Primary Source 1 → Secondary Source 2

Primary sources are ONE step away from the information or event.

Secondary sources are TWO steps away from the information or event.

Practice

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

Encyclopedia	Primary Source / (Secondary Source)
Blog	(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. _____

NAME: _____

DATE: _____

10.1 Activity Page

Energy Island

Directions: After reading *Energy Island*, pages 1–12, complete the chart and answer the question below.

Problem		Solution	
Cause	Effect	Claim	Counterclaim
• Oil tankers have to travel to deliver oil to the island. • Electricity was sent from the mainland.	• The Ministry of Environment and Energy selects Samsø to become independent of nonrenewable energy.	• Wind energy could be used to power the island.	• too expensive • too busy • too bothersome • prefer trucks to bicycles • it won't make a difference. • too old for change

- Who is the audience the author of *Energy Island* is writing for? How can you tell?

_____

_____

_____

_____

NAME: _____

DATE: _____

12.1 Activity Page

"Clean Energy"

Directions: Use the T-chart below to take notes as you read "Clean Energy."

Central Idea	Details

Ask Yourself

Does any of the information in this article support your essay's claim or connect to your essay's counterclaim? Why or why not?

Answers may vary but should answer the questions with reasoning.

NAME: _____

DATE: _____

13.1 Activity Page

"Houston Affects the Earth": Analysis Activity

Directions: Answer the questions below for the article "Houston Affects the Earth." Remember to support your answer with details from the text.

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

   Houston should reduce pollution.

2. What are some changes that Houston put in place?

   Increased the use of solar energy; created "Bike to Work Day" to reduce gasoline use and "Lights Out Houston" to encourage businesses to turn off lights at night, etc.

3. Did the changes have the impact the mayor hoped for? Why or why not?

   Answers may vary but should include supporting evidence from the text.

4. How are Houston's efforts the same or different from the efforts for change on the island of Samsø? Explain.

   Answers may vary but should contain supporting evidence from BOTH texts.

NAME: _____

DATE: _____

14.1 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?

drought

Cause: What caused this problem?	Effect: What effects does this have on the village?
drought	food scarcity

Claim: What does William believe will fix the problem?	What challenges does he face?
creating his own energy using a windmill	• finding materials • learning to build the windmill • doubt from community"

Solution: How is the problem solved?

William perseveres and teaches himself how to build the windmill. He got help from friends and family.

Think About It:
How does a wind turbine work? Can any be found where you live? Use your research skills to find out!

Answers may vary.

TEXAS ESSENTIAL KNOWLEDGE AND SKILLS - GRADE 4

Unit 8		Correlation—Teacher's Guide
(1) Developing and sustaining foundational language skills: listening, speaking, discussion, and thinking—oral language. The student develops oral language through listening, speaking, and discussion. The student is expected to:		
TEKS 4.1.A	listen actively, ask relevant questions to clarify information, and make pertinent comments	U8: p. 6, U8: p. 10, U8: p. 11, U8: p. 18, U8: p. 22
TEKS 4.1.B	follow, restate, and give oral instructions that involve a series of related sequences of action	
TEKS 4.1.C	express an opinion supported by accurate information, employing eye contact, speaking rate, volume, and enunciation, and the conventions of language to communicate ideas effectively	U8: p. 6, U8: p. 10
TEKS 4.1.D	work collaboratively with others to develop a plan of shared responsibilities	
(2) Developing and sustaining foundational language skills: listening, speaking, reading, writing, and thinking—beginning reading and writing. The student develops word structure knowledge through phonological awareness, print concepts, phonics, and morphology to communicate, decode, and spell. The student is expected to:		
(A) demonstrate and apply phonetic knowledge by:		
TEKS 4.2.A.i	decoding words with specific orthographic patterns and rules, including regular and irregular plurals	
TEKS 4.2.A.ii	decoding multisyllabic words with closed syllables, open syllables, VCe syllables, vowel teams, including digraphs and diphthongs, r-controlled syllables, and final stable syllables	
TEKS 4.2.A.iii	decoding words using advanced knowledge of syllable division patterns such as VV	
TEKS 4.2.A.iv	decoding words using knowledge of prefixes	
TEKS 4.2.A.v	decoding words using knowledge of suffixes, including how they can change base words such as dropping e, changing y to i, and doubling final consonants	
TEKS 4.2.A.vi	identifying and reading high-frequency words from a research-based list	
(B) demonstrate and apply spelling knowledge by:		
TEKS 4.2.B.i	spelling multisyllabic words with closed syllables, open syllables, VCe syllables, vowel teams, including digraphs and diphthongs, r-controlled syllables, and final stable syllables	
TEKS 4.2.B.ii	spelling homophones	
TEKS 4.2.B.iii	spelling multisyllabic words with multiple sound-spelling patterns	
TEKS 4.2.B.iv	spelling words using advanced knowledge of syllable division patterns	
TEKS 4.2.B.v	spelling words using knowledge of prefixes	
TEKS 4.2.B.vi	spelling words using knowledge of suffixes, including how they can change base words such as dropping e, changing y to i, and doubling final consonants	

TEXAS ESSENTIAL KNOWLEDGE AND SKILLS - GRADE 4

Unit 8		Correlation—Teacher's Guide
TEKS 4.2.C	write legibly in cursive to complete assignments	
(3) Developing and sustaining foundational language skills: listening, speaking, reading, writing, and thinking—vocabulary. The student uses newly acquired vocabulary expressively. The student is expected to:		
TEKS 4.3.A	use print or digital resources to determine meaning, syllabication, and pronunciation	
TEKS 4.3.B	use context within and beyond a sentence to determine the relevant meaning of unfamiliar words or multiple-meaning words	
TEKS 4.3.C	determine the meaning of and use words with affixes such as *mis-*, *sub-*, *-ment*, and *-ity/ty* and roots such as auto, graph, and meter	
TEKS 4.3.D	identify, use, and explain the meaning of homophones such as reign/rain	
(4) Developing and sustaining foundational language skills: listening, speaking, reading, writing, and thinking—fluency. The student reads grade-level text with fluency and comprehension. The student is expected to use appropriate fluency (rate, accuracy, and prosody) when reading grade-level text.		
TEKS 4.4.A	use appropriate fluency (rate, accuracy, and prosody) when reading grade-level text	
(5) Developing and sustaining foundational language skills: listening, speaking, reading, writing , and thinking—self-sustained reading. The student reads grade-appropriate texts independently. The student is expected to self-select text and read independently for a sustained period of time.		
TEKS 4.5.A	self-select text and read independently for a sustained period of time	
(6) Comprehension skills: listening, speaking, reading, writing, and thinking using multiple texts. The student uses metacognitive skills to both develop and deepen comprehension of increasingly complex texts. The student is expected to:		
TEKS 4.6.A	establish purpose for reading assigned and self-selected texts	
TEKS 4.6.B	generate questions about text before, during, and after reading to deepen understanding and gain information	
TEKS 4.6.C	make, correct, or confirm predictions using text features, characteristics of genre, and structures	U8: p. 11, U8: p. 62, U8: p.66
TEKS 4.6.D	create mental images to deepen understanding	U8: p. 28, U8: p. 32
TEKS 4.6.E	make connections to personal experiences, ideas in other texts, and society	U8: p. 84, U8: p. 88
TEKS 4.6.F	make inferences and use evidence to support understanding	U8: p. 62, U8: p. 66
TEKS 4.6.G	evaluate details read to determine key ideas	U8: p. 18, U8: p. 23, U8: p. 26, U8: p. 40, U8: p. 44, U8: p. 116, U8: p. 119
TEKS 4.6.H	synthesize information to create new understanding	U8: p. 28, U8: p. 32, U8: p. 52, U8: p. 56, U8: p. 74, U8: p. 78, U8: p. 122, U8: p. 125

TEXAS ESSENTIAL KNOWLEDGE AND SKILLS - GRADE 4

Unit 8		Correlation—Teacher's Guide
TEKS 4.6.I	monitor comprehension and make adjustments such as re-reading, using background knowledge, asking questions, and annotating when understanding breaks down	
(7) Response skills: listening, speaking, reading, writing, and thinking using multiple texts. The student responds to an increasingly challenging variety of sources that are read, heard, or viewed. The student is expected to:		
TEKS 4.7.A	describe personal connections to a variety of sources including self-selected texts	
TEKS 4.7.B	write responses that demonstrate understanding of texts, including comparing and contrasting ideas across a variety of sources	U8: p. 92, U8: p. 96
TEKS 4.7.C	use text evidence to support an appropriate response	
TEKS 4.7.D	retell, paraphrase or summarize texts in ways that maintain meaning and logical order	
TEKS 4.7.E	interact with sources in meaningful ways such as notetaking, annotating, freewriting, or illustrating	U8: p. 18, U8: p. 26, U8: p. 62, U8: p. 70
TEKS 4.7.F	Use newly acquired vocabulary as appropriate	
TEKS 4.7.G	discuss specific ideas in the text that are important to the meaning	
(8) Multiple genres: listening, speaking, reading, writing, and thinking using multiple texts—literary elements. The student recognizes and analyzes literary elements within and across increasingly complex traditional, contemporary, classical, and diverse literary texts. The student is expected to:		
TEKS 4.8.A	infer basic themes supported by text evidence	U8: p. 108, U8: p. 112
TEKS 4.8.B	explain the interactions of the characters and the changes they undergo	
TEKS 4.8.C	analyze plot elements, including the rising action, climax, falling action, and resolution	U8: p. 130, U8: p. 133
TEKS 4.8.D	explain the influence of the setting, including historical and cultural settings, on the plot	U8: p. 130, U8: p. 133
(9) Multiple genres: listening, speaking, reading, writing, and thinking using multiple texts—genres. The student recognizes and analyzes genre-specific characteristics, structures, and purposes within and across increasingly complex traditional, contemporary, classical, and diverse texts. The student is expected to:		
TEKS 4.9.A	demonstrate knowledge of distinguishing characteristics of well-known children's literature such as folktales, fables, legends, myths, and tall tales	
TEKS 4.9.B	explain figurative language such as simile, metaphor, and personification that the poet uses to create images	
TEKS 4.9.C	explain structure in drama such as character tags, acts, scenes, and stage directions	
(D) recognize characteristics and structures of informational text, including:		

TEXAS ESSENTIAL KNOWLEDGE AND SKILLS - GRADE 4

Unit 8		Correlation—Teacher's Guide
TEKS 4.9.D.i	the central idea with supporting evidence	
TEKS 4.9.D.ii	features such as pronunciation guides and diagrams to support understanding	
TEKS 4.9.D.iii	organizational patterns such as compare and contrast	
(E) recognize characteristics and structures of argumentative text by:		
TEKS 4.9.E.i	identifying the claim	U8: p. 28, U8: p. 37, U8: p. 100, U8: p. 104
TEKS 4.9.E.ii	explaining how the author has used facts for an argument	U8: p. 28, U8: p. 37, U8: p. 40, U8: p. 48, U8: p. 100, U8: p. 104
TEKS 4.9.E.iii	identifying the intended audience or reader	U8: p. 100, U8: p. 104
TEKS 4.9.F	recognize characteristics of multimodal and digital texts	U8: p. 130, U8: p. 135
(10) Author's purpose and craft: listening, speaking, reading, writing, and thinking using multiple texts. The student uses critical inquiry to analyze the authors' choices and how they influence and communicate meaning within a variety of texts. The student analyzes and applies author's craft purposefully in order to develop their own products and performances. The student is expected to:		
TEKS 4.10.A	explain the author's purpose and message within a text	
TEKS 4.10.B	explain how the use of text structure contributes to the author's purpose	
TEKS 4.10.C	analyze the author's use of print and graphic features to achieve specific purposes	
TEKS 4.10.D	describe how the author's use of imagery, literal and figurative language such as simile and metaphor, and sound devices such as alliteration and assonance achieves specific purposes	
TEKS 4.10.E	identify and understand the use of literary devices, including first- or third-person point of view;	
TEKS 4.10.F	discuss how the author's use of language contributes to voice	
TEKS 4.10.G	identify and explain the use of anecdote	
(11) Composition: listening, speaking, reading, writing, and thinking using multiple texts—writing process. The student uses the writing process recursively to compose multiple texts that are legible and uses appropriate conventions. The student is expected to:		
TEKS 4.11.A	plan a first draft by selecting a genre for a particular topic, purpose, and audience using a range of strategies such as brainstorming, freewriting, and mapping	U8: p. 6, U8: p. 16, U8: p. 52, U8: p. 60
(B) develop drafts into a focused, structured, and coherent piece of writing by:		
TEKS 4.11.B.i	organizing with purposeful structure, including an introduction, transitions, and a conclusion	U8: p. 108, U8: p. 113
TEKS 4.11.B.ii	developing an engaging idea with relevant details	

TEXAS ESSENTIAL KNOWLEDGE AND SKILLS - GRADE 4

Unit 8		Correlation—Teacher's Guide
TEKS 4.11.C	revise drafts to improve sentence structure and word choice by adding, deleting, combining, and rearranging ideas for coherence and clarity	U8: p. 116, U8: p. 120
(D) edit drafts using standard English conventions, including:		
TEKS 4.11.D	edit drafts using standard English conventions	U8: p. 122, U8: p. 126
TEKS 4.11.D.i	complete simple and compound sentences with subject-verb agreement and avoidance of splices, run-ons, and fragments	
TEKS 4.11.D.ii	past tense of irregular verbs	
TEKS 4.11.D.iii	singular, plural, common, and proper nouns	
TEKS 4.11.D.iv	adjectives, including their comparative and superlative forms	
TEKS 4.11.D.v	adverbs that convey frequency and adverbs that convey degree	
TEKS 4.11.D.vi	prepositions and prepositional phrases	
TEKS 4.11.D.vii	pronouns, including reflexive	
TEKS 4.11.D.viii	coordinating conjunctions to form compound subjects, predicates, and sentences	
TEKS 4.11.D.ix	capitalization of historical periods, events and documents; titles of books; stories and essays; and languages, races, and nationalities	
TEKS 4.11.D.x	punctuation marks including apostrophes in possessives, commas in compound sentences, and quotation marks in dialogue	
TEKS 4.11.D.xi	correct spelling of words with gradeappropriate orthographic patterns and rules and high-frequency words	
TEKS 4.11.E	publish written work for appropriate audiences	U8: p. 138, U8: p. 140
(12) Composition: listening, speaking, reading, writing, and thinking using multiple texts—genres. The student uses genre characteristics and craft to compose multiple texts that are meaningful. The student is expected to:		
TEKS 4.12.A	compose literary texts such as personal narratives and poetry using genre characteristics and craft	
TEKS 4.12.B	compose informational texts, including brief compositions that convey information about a topic, using a clear central idea and genre characteristics and craft	
TEKS 4.12.C	compose argumentative texts, including opinion essays, using genre characteristics and craft	U8: p. 28; U8: p. 37
TEKS 4.12.D	compose correspondence that requests information	

TEXAS ESSENTIAL KNOWLEDGE AND SKILLS - GRADE 4

Unit 8		Correlation—Teacher's Guide
(13) Inquiry and research: listening, speaking, reading, writing, and thinking using multiple texts. The student engages in both short-term and sustained recursive inquiry processes for a variety of purposes. The student is expected to:		
TEKS 4.13.A	generate and clarify questions on a topic for formal and informal inquiry	U8: p. 74, U8: p. 82
TEKS 4.13.B	develop and follow a research plan with adult assistance	
TEKS 4.13.C	identify and gather relevant information from a variety of sources	U8: p. 92, U8: p. 98, U8: p. 100, U8: p. 106
TEKS 4.13.D	Identify primary and secondary sources	U8: p. 84, U8: p. 89
TEKS 4.13.E	demonstrate understanding of information gathered	
TEKS 4.13.F	recognize the difference between paraphrasing and plagiarism when using source materials	
TEKS 4.13.G	develop a bibliography	
TEKS 4.13.H	use an appropriate mode of delivery, whether written, oral, or multimodal, to present results	U8: p. 138, U8: p. 141

ENGLISH LANGUAGE PROFICIENCY STANDARDS - GRADE 4

Unit 8		Correlation—Teacher's Guide
(1) Cross-curricular second language acquisition/learning strategies. The ELL uses language learning strategies to develop an awareness of their own learning processes in all content areas. In order for the ELL to meet grade-level learning expectations across the foundation and enrichment curriculum, all instruction delivered in English must be linguistically accommodated (communicated, sequenced, and scaffolded) commensurate with the student's level of English language proficiency. The student is expected to:		
ELPS 1.A	use prior knowledge and experiences to understand meanings in English	U8: p. 64, U8: p. 88, U8: p. 134
ELPS 1.B	monitor oral and written language production and employ self-corrective techniques or other resources	U8: p. 61, U8: p. 88, U8: p. 142
ELPS 1.C	use strategic learning techniques such as concept mapping, drawing, memorizing, comparing, contrasting, and reviewing to acquire basic and grade-level vocabulary	U8: p. 37, U8: p. 61, U8: p. 69, U8: p. 90, U8: p. 128, U8: p. 136
ELPS 1.D	speak using learning strategies such as requesting assistance, employing non-verbal cues, and using synonyms and circumlocution (conveying ideas by defining or describing when exact English words are not known)	U8: p. 25, U8: p. 113
ELPS 1.E	internalize new basic and academic language by using and reusing it in meaningful ways in speaking and writing activities that build concept and language attainment	U8: p. 27, U8: p. 38, U8: p. 90, U8: p. 107
ELPS 1.F	use accessible language and learn new and essential language in the process	U8: p. 17, U8: p. 37, U8: p. 113
ELPS 1.G	demonstrate an increasing ability to distinguish between formal and informal English and an increasing knowledge of when to use each one commensurate with grade-level learning expectations	
ELPS 1.H	develop and expand repertoire of learning strategies such as reasoning inductively or deductively, looking for patterns in language, and analyzing sayings and expressions commensurate with grade-level learning expectations	U8: p. 83
(2) Cross-curricular second language acquisition/listening. The ELL listens to a variety of speakers including teachers, peers, and electronic media to gain an increasing level of comprehension of newly acquired language in all content areas. ELLs may be at the beginning, intermediate, advanced, or advanced high stage of English language acquisition in listening. In order for the ELL to meet grade-level learning expectations across the foundation and enrichment curriculum, all instruction delivered in English must be linguistically accommodated (communicated, sequenced, and scaffolded) commensurate with the student's level of English language proficiency. The student is expected to:		
ELPS 2.A	distinguish sounds and intonation patterns of English with increasing ease	
ELPS 2.B	recognize elements of the English sound system in newly acquired vocabulary such as long and short vowels, silent letters, and consonant clusters	
ELPS 2.C	learn new language structures, expressions, and basic and academic vocabulary heard during classroom instruction and interactions	

ENGLISH LANGUAGE PROFICIENCY STANDARDS - GRADE 4

Unit 8		Correlation—Teacher's Guide
ELPS 2.D	monitor understanding of spoken language during classroom instruction and interactions and seek clarification as needed	
ELPS 2.E	use visual, contextual, and linguistic support to enhance and confirm understanding of increasingly complex and elaborated spoken language	U8: p. 15, U8: p. 17, U8: p. 25, U8: p. 27, U8: p. 81, U8: p. 107, U8: p. 120
ELPS 2.F	listen to and derive meaning from a variety of media such as audio tape, video, DVD, and CD ROM to build and reinforce concept and language attainment	
ELPS 2.G	understand the general meaning, main points, and important details of spoken language ranging from situations in which topics, language, and contexts are familiar to unfamiliar	
ELPS 2.H	understand implicit ideas and information in increasingly complex spoken language commensurate with grade-level learning expectations	
ELPS 2.I	demonstrate listening comprehension of increasingly complex spoken English by following directions, retelling or summarizing spoken messages, responding to questions and requests, collaborating with peers, and taking notes commensurate with content and grade-level needs	
(3) Cross-curricular second language acquisition/speaking. The ELL speaks in a variety of modes for a variety of purposes with an awareness of different language registers (formal/informal) using vocabulary with increasing fluency and accuracy in language arts and all content areas. ELLs may be at the beginning, intermediate, advanced, or advanced high stage of English language acquisition in speaking. In order for the ELL to meet grade-level learning expectations across the foundation and enrichment curriculum, all instruction delivered in English must be linguistically accommodated (communicated, sequenced, and scaffolded) commensurate with the student's level of English language proficiency. The student is expected to:		
ELPS 3.A	practice producing sounds of newly acquired vocabulary such as long and short vowels, silent letters, and consonant clusters to pronounce English words in a manner that is increasingly comprehensible	
ELPS 3.B	expand and internalize initial English vocabulary by learning and using high-frequency English words necessary for identifying and describing people, places, and objects, by retelling simple stories and basic information represented or supported by pictures, and by learning and using routine language needed for classroom communication	
ELPS 3.C	speak using a variety of grammatical structures, sentence lengths, sentence types, and connecting words with increasing accuracy and ease as more English is acquired	
ELPS 3.D	speak using grade-level content area vocabulary in context to internalize new English words and build academic language proficiency	U8: p. 17

ENGLISH LANGUAGE PROFICIENCY STANDARDS - GRADE 4

Unit 8		Correlation—Teacher's Guide
ELPS 3.E	share information in cooperative learning interactions	U8: p. 72, U8: p. 83, U8: p. 98, U8: p. 99, U8: p. 106, U8: p. 114, U8: p. 120, U8: p. 128, U8: p. 134, U8: p. 142
ELPS 3.F	ask and give information ranging from using a very limited bank of high-frequency, high-need, concrete vocabulary, including key words and expressions needed for basic communication in academic and social contexts, to using abstract and content-based vocabulary during extended speaking assignments	U8: p. 50, U8: p. 59, U8: p. 81, U8: p. 106, U8: p. 128
ELPS 3.G	express opinions, ideas, and feelings ranging from communicating single words and short phrases to participating in extended discussions on a variety of social and gradeappropriate academic topics	U8: p. 37
ELPS 3.H	narrate, describe, and explain with increasing specificity and detail as more English is acquired	U8: p. 121
ELPS 3.I	adapt spoken language appropriately for formal and informal purposes	
ELPS 3.J	respond orally to information presented in a wide variety of print, electronic, audio, and visual media to build and reinforce concept and language attainment	
(4) Cross-curricular second language acquisition/reading. The ELL reads a variety of texts for a variety of purposes with an increasing level of comprehension in all content areas. ELLs may be at the beginning, intermediate, advanced, or advanced high stage of English language acquisition in reading. In order for the ELL to meet grade-level learning expectations across the foundation and enrichment curriculum, all instruction delivered in English must be linguistically accommodated (communicated, sequenced, and scaffolded) commensurate with the student's level of English language proficiency. For kindergarten and grade 1, certain of these student expectations apply to text read aloud for students not yet at the stage of decoding written text. The student is expected to:		
ELPS 4.A	learn relationships between sounds and letters of the English language and decode (sound out) words using a combination of skills such as recognizing sound-letter relationships and identifying cognates, affixes, roots, and base words	
ELPS 4.B	recognize directionality of English reading such as left to right and top to bottom	
ELPS 4.C	develop basic sight vocabulary, derive meaning of environmental print, and comprehend English vocabulary and language structures used routinely in written classroom materials	
ELPS 4.D	use prereading supports such as graphic organizers, illustrations, and pretaught topicrelated vocabulary and other prereading activities to enhance comprehension of written text	U8: p. 50, U8: p. 59, U8: p. 98, U8: p. 121, U8: p. 125
ELPS 4.E	read linguistically accommodated content area material with a decreasing need for linguistic accommodations as more English is learned	

ENGLISH LANGUAGE PROFICIENCY STANDARDS - GRADE 4

Unit 8		Correlation—Teacher's Guide
ELPS 4.F	use visual and contextual support and support from peers and teachers to read grade-appropriate content area text, enhance and confirm understanding, and develop vocabulary, grasp of language structures, and background knowledge needed to comprehend increasingly challenging language	U8: p. 114, U8: p. 134
ELPS 4.G	demonstrate comprehension of increasingly complex English by participating in shared reading, retelling or summarizing material, responding to questions, and taking notes commensurate with content area and grade level needs	U8: p. 48
ELPS 4.H	read silently with increasing ease and comprehension for longer periods	
ELPS 4.I	demonstrate English comprehension and expand reading skills by employing basic reading skills such as demonstrating understanding of supporting ideas and details in text and graphic sources, summarizing text, and distinguishing central ideas from details commensurate with content area needs	
ELPS 4.J	demonstrate English comprehension and expand reading skills by employing inferential skills such as predicting, making connections between ideas, drawing inferences and conclusions from text and graphic sources, and finding supporting text evidence commensurate with content area needs	
ELPS 4.K	demonstrate English comprehension and expand reading skills by employing analytical skills such as evaluating written information and performing critical analyses commensurate with content area and grade-level needs	
(5) Cross-curricular second language acquisition/writing. The ELL writes in a variety of forms with increasing accuracy to effectively address a specific purpose and audience in all content areas. ELLs may be at the beginning, intermediate, advanced, or advanced high stage of English language acquisition in writing. In order for the ELL to meet grade-level learning expectations across foundation and enrichment curriculum, all instruction delivered in English must be linguistically accommodated (communicated, sequenced, and scaffolded) commensurate with the student's level of English language proficiency. For kindergarten and grade 1, certain of these student expectations do not apply until the student has reached the stage of generating original written text using a standard writing system. The student is expected to:		
ELPS 5.A	learn relationships between sounds and letters of the English language to represent sounds when writing in English	
ELPS 5.B	write using newly acquired basic vocabulary and content-based grade-level vocabulary	U8: p. 38
ELPS 5.C	spell familiar English words with increasing accuracy, and employ English spelling patterns and rules with increasing accuracy as more English is acquired	

ENGLISH LANGUAGE PROFICIENCY STANDARDS - GRADE 4

Unit 8		Correlation—Teacher's Guide
ELPS 5.D	edit writing for standard grammar and usage, including subject-verb agreement, pronoun agreement, and appropriate verb tenses commensurate with grade-level expectations as more English is acquired	
ELPS 5.E	employ increasingly complex grammatical structures in content area writing commensurate with grade level expectations such as (i) using correct verbs, tenses, and pronouns/antecedents; (ii) using possessive case (apostrophe -s) correctly; and, (iii) using negatives and contractions correctly	
ELPS 5.F	write using a variety of grade-appropriate sentence lengths, patterns, and connecting words to combine phrases, clauses, and sentences in increasingly accurate ways as more English is acquired	
ELPS 5.G	narrate, describe, and explain with increasing specificity and detail to fulfill content area writing needs as more English is acquired	

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Energy

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ENGLISH

Grade 4

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Energy

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Energy:
Past, Present, and Future

Activity Book

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Unit 8

Energy: Past, Present, and Future

Activity Book

This Activity Book contains activity pages that accompany many of the lessons from the Teacher Guide for Unit 8. 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: _____

1.1 **Activity Page**

Modern Inventions Make Life Easier

Directions: Think about the machines and inventions you use 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	Health and Medicine	Food	Transportation
telephone	*x-ray machine*	*stove*	*trains*
Other			

NAME: _____

DATE: _____

Vocabulary

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

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

fuel, n. substances, such as food, that are used to give the body energy

fuel, v. to supply power or energy
Example: fuel an argument

energy, n. power needed to run a machine

energy, n. power needed for physical activity

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. substances that can be burned as a source of energy
Breakfast is your **fuel** for the day.	• **oil,** n. slippery liquid made from petroleum used for fuel
My first goal **fueled** my victory.	• **energy,** n. power needed for physical activity
The battery was too low on **energy** to turn on the toy.	• **fuel,** n. substances, such as food, that are used to give the body energy
By the end of the day my body is out of **energy**.	• **energy,** n. power needed to run a machine

NAME: _____

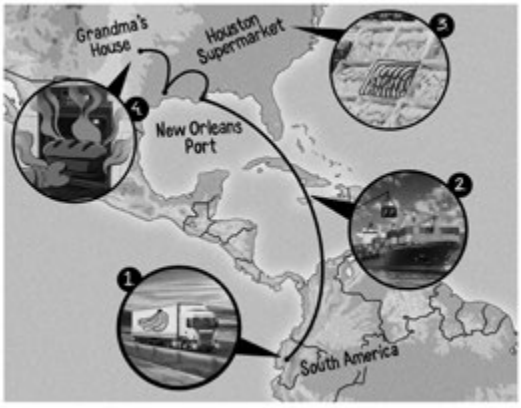
DATE: _____

"Banana Bread and the Story of Oil"

Banana Shopping

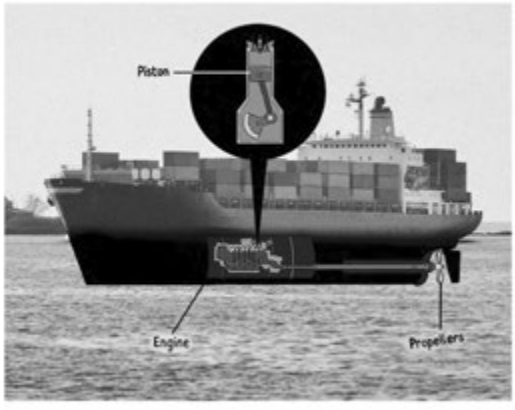
Suppose you're watching a cooking show you really love. There's a recipe for banana bread. "Hmm," you think. "I'd like to try cooking that!"

So 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. 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 based on a fluid based on petroleum.) Engine oil is very easy to set on fire! 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.

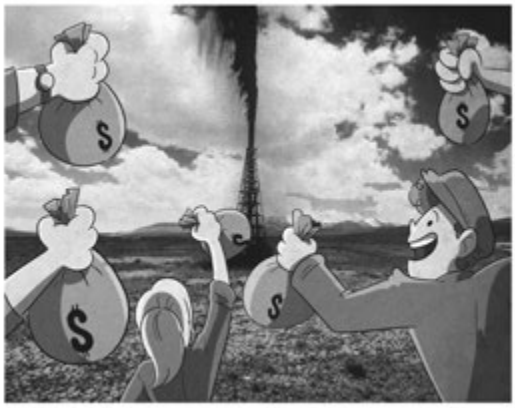
World Without Gas

Our world would be very different without oil. In the days before oil, it really was very different! People ate different foods, and traveled less, and worked in different ways. Before oil, you might never meet anyone from outside your hometown, unless you made a very special effort. 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? Will we keep using it forever? And if not, what's going to come next?

In this unit, we'll answer some of these questions. We'll look at how far back the story of oil goes: all the way to prehistoric times and the age of the dinosaurs! Oil began with living beings, especially prehistoric animals and plants. Over time, these living creatures died and were sealed underground. There, their bodies broke down and were slowly transformed into the oil we burn. (One reason oil burns so well is that it's made up of carbon, a key part of the cells of all living beings.)



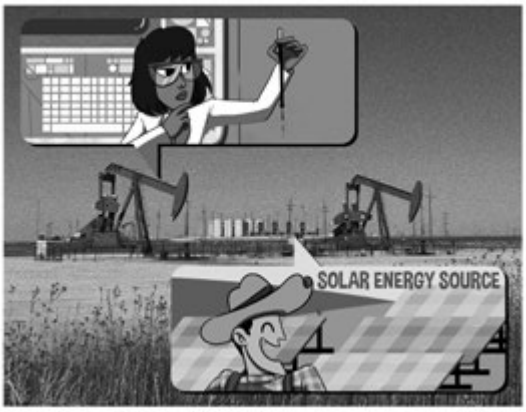
"Spindletop"

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 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. Many of the workers were Black people from the Mississippi Delta, home of the "Delta blues." They brought their music with them, which combined with Texas country and gospel music to form a new style. And over time, the children and grandchildren of the Black oil workers formed a large Black population in Houston. 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 how it's going to end! Remember, oil is formed from prehistoric living creatures. But there are only so many of those creatures who ever lived, which means there's only so much oil to find. Once it runs out, it's gone. So scientists are exploring how to use sources of renewable energy that will do everything oil did, but without running out. 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 the start of the next story our society tells.

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 end of it.

NAME: _____

DATE: _____

Sorting Organizer

Directions:

Brainstorm with your group, "What inventions in everyday life need fuel to run?" Write your group's ideas in the space below.

Sort your ideas by type of fuel. Rewrite the ideas in the box above into the chart below using the categories listed. Use the blank column for a type of fuel not already listed, if needed.

Fossil Fuels (gasoline, heating oil, propane)	**Batteries**	**Wind Power**	**Solar Power**	

NAME: _____

DATE: _____

Lesson 1: Think About It

Directions: Using what you learned in this lesson, answer the prompt below in complete sentences.

Name three important uses of energy in your daily life.

_____

_____

_____

NAME: _____

DATE: _____

T-Chart Notes

Buried Sunlight

Central Idea	**Details**
The Sun's Energy	
Where does the sun's energy come from?	
Cycle of Life	
Fossil Fuels	

NAME: _____

DATE: _____

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 *Buried Sunlight* and your notes from *Buried Sunlight* T-chart notes, Activity Page 2.1 to help you.

Part 2: Rewrite your sentences as directed by your teacher. Mix up the order of your sentences and exchange them with a partner. Can you put your partner's sentences back in the right order using their transition words?

NAME: _____

DATE: _____

Visualizing: Stop and Sketch

Directions:

Part 1: Listen as your teacher reads the text. Imagine what you are hearing as pictures in your mind. At each pause in the text, stop and sketch what you visualized.

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: _____

Make a Claim

Example:

I claim that chocolate ice cream is the best flavor ever. It is the best because chocolate and ice cream are two great desserts and together make the best ice cream choice.

Directions: Make two claims about the events in the text you read. Defend your claim with evidence from the text.

1. I claim that _____

_____

because _____

_____.

2. I claim that _____

_____

because _____

_____.

NAME: _____

DATE: _____

"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?

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?

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

NAME: _____

DATE: _____

Argumentative Essay Model

I Scream for Chocolate Ice Cream

On a hot day, there is nothing like an ice cream cone covered in your favorite toppings. When you step up to the counter, the choice is clear. The best flavor of ice cream is chocolate.

To start, chocolate is one of the most popular flavors, not just of ice cream, but all kinds of desserts. Every restaurant has a chocolate treat. Stores are filled with chocolate on holidays like Halloween and Valentine's Day. Chocolate is even known to have some health benefits!

Some people might say that chocolate ice cream has its downsides. For instance, it can stain your clothing. On the other hand, who doesn't want to see the wonderful memory of that chocolate banana split sundae the next time you wear those shorts? There is no downside to chocolate ice cream that isn't made better by that delicious flavor melting over your tongue.

Ice cream is great and chocolate is great, so why don't we put them together? Chocolate ice cream is popular for good reason. It is the best. Chocolate can even be good for your health when added to your diet in small amounts. So the next time the scooper asks what flavor, say chocolate.

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 4.2 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 dogs that have hair instead of fur and are great for people who get the sniffles from other furry pets like cats.

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 everyday. Dogs are by far the best pets.

NAME: _____

DATE: _____

"Big Changes"

Directions: Read "Big Changes." Notice how the extraction of oil caused several effects in the town of Beaumont. Complete the chart below to retell some of these cause-effect events.

Cause	Effect
	Workers passed out frequently.
There was not enough housing for the 41,000 new people in Beaumont.	
	Grocery stores were open all night.
There was not enough fresh water.	
There were not enough doctors.	
	Fires broke out often.
Many people came to the area with lots of money.	

State a Claim

Overall, was the boom in Beaumont a positive experience for the town?

_____

_____

_____

_____

_____

NAME: _____

DATE: _____

6.1 **Activity Page**

"A New Fuel"

Directions: Read "A New Fuel" and consider the challenges being faced for the new oil industry. Using the chart below, record how the problems occurred and the solutions that solved them. Use the example to help you.

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

Think About It

After discovering such a large amount of oil at Spindletop, how were the lives of everyday people across the country impacted?

_____

_____

_____

NAME: _____

DATE: _____

Research Guide

Your Claim: A fuel of the future is _____

What do you need to learn to support your claim?

Research Questions:

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

To turn your research into an essay you need to change your notes into sentences. Use the chart below to help you.

Facts from Research	Sentence Form
Example: • Moisture wicking fabric patented in 1998 • Speakers sewn into headband for exercising • Baby monitors in socks to watch oxygen and breathing	Some clothing has more advanced technology, like special materials that wick away moisture or contain high-tech features such as speakers or oxygen monitors.

NAME: _____

DATE: _____

8.1 **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 dangers of working near an oil well?		

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: _____

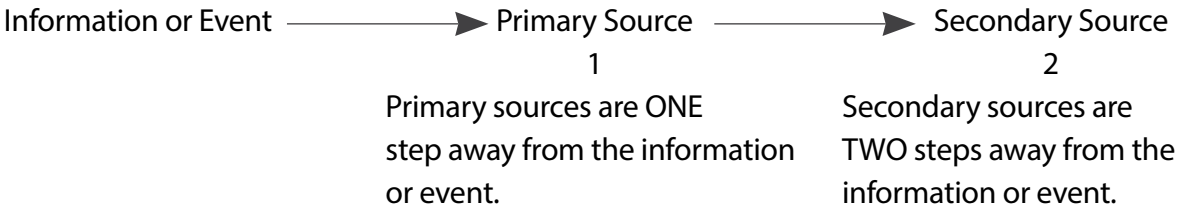
DATE: _____

8.2 **Activity Page**

Primary and Secondary Sources

When researchers are collecting information they often use primary sources. A primary source is a person who knows about a topic firsthand. They are either an expert on a subject or a witness to an event. These sources are useful because they are very accurate.

Secondary sources are created using information from a primary source, like books and articles. 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	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. _____

NAME: _____

DATE: _____

Conduct an Interview

Directions:

1. Write your questions from Activity Page 8.2 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: _____

Comparing Energy Sources

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

	Pros	Cons
Fossil Fuels		
Solar Energy		
Wind Energy		
Hydropower		

NAME: _____

DATE: _____

Presentation Checklist

- ☐ 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

NAME: _____

DATE: _____

Lesson 9 Exit Ticket

1. How many different sources have you used to take notes, so far? _____

   _____

   _____

   _____

2. Do you find certain types of sources more useful than others? (circle one) Yes / No
   What makes a source useful for your research? _____

   _____

   _____

   _____

3. How many facts from your notes have been included in your essay so far?_____

   _____

   _____

   _____

NAME: _____

DATE: _____

10.1 **Activity Page**

Energy Island

Directions: After reading *Energy Island*, pages 1–12, complete the chart and answer the question below.

Problem		**Solution**	
Cause	Effect	Claim	Counterclaim
• Oil tankers have to travel to deliver oil to the island. •	• The Ministry of Environment and Energy selects Samsø to become independent of nonrenewable energy.		• too expensive • • • • too old for change

- Who is the audience the author of *Energy Island* is writing for? How can you tell?

_____

_____

_____

_____

NAME: _____

DATE: _____

10.2 **Activity Page**

Write a Counterclaim

Example:

Claim: I claim that *chocolate ice cream is the best flavor ever.*

Negative about the claim: Creates stains

Counterclaim: *Chocolate cannot be the best flavor ice cream* because it may stain your clothes.

Directions: Rename your claim and negatives about that claim (even if you do not agree). Rewrite those negative counterclaims into sentence form.

Claim: _____

Negative about the claim: _____

Counterclaim Sentence: _____

Transfer your counterclaim sentence above to your essay. Add details from your research explaining why that counterclaim is wrong.

NAME: _____

DATE: _____

10.3 **Activity Page**

Write Your Argumentative Essay

Checklist	Completed?
Introduction: State the claim.	
Body Paragraph: Defend the claim.	
Body Paragraph: Defend against a counterclaim.	
Conclusion: Restate the claim.	

NAME: _____

DATE: _____

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.	

Editing Checklist	After checking for each item, place a checkmark here.
Correct grammar	
Correct capitalization	
Correct spelling	
Correct punctuation	

NAME: _____

DATE: _____

12.1 **Activity Page**

"Clean Energy"

Directions: Use the T-chart below to take notes as you read "Clean Energy."

Central Idea	Details

Ask Yourself

Does any of the information in this article support your essay's claim or connect to your essay's counterclaim? Why or why not?

_____

_____

_____

_____

NAME: _____

DATE: _____

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:

- _____
- _____
- _____

☐ Counterclaim: _____

☐ Evidence to defend against the counterclaim:

- _____
- _____
- _____

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.
Editing	
☐	Correct grammar
☐	Correct capitalization
☐	Correct spelling
☐	Correct punctuation

Give a Compliment

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

NAME: _____

DATE: _____

13.1 Activity Page

"Houston Affects the Earth": Analysis Activity

Directions: Answer the questions below for the article "Houston Affects the Earth." Remember to support your answer with details from the text.

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

_____

_____

_____

2. What are some changes that Houston put in place?

_____

_____

_____

3. Did the changes have the impact the mayor hoped for? Why or why not?

_____

_____

_____

4. How are Houston's efforts the same or different from the efforts for change on the island of Samsø? Explain.

_____

_____

_____

NAME: _____

DATE: _____

Argumentative Essay

	Exceeding	Meeting	Developing
Introduction	The claim is stated clearly in a manner that gains the reader's attention.	The claim is stated clearly.	The claim is missing or unclear.
Body	The body paragraphs contain facts that support the claim and dispute a counterclaim.	The body paragraphs contain facts that support the claim.	The body paragraphs contain no facts that support the claim.
Conclusion	The conclusion restates the claim in a compelling way that uses craft, such as the writer's voice and style.	The conclusion contains a restated claim that engages the reader.	The conclusion is missing the restated claim or does not engage the reader.
Structure	The essay is carefully organized using an attention-grabbing introduction, consistently used transitions, and an effective conclusion.	The essay is organized using an introduction, transitions, and conclusion.	The essay is disorganized and missing one or more of the following: an introduction, transitions, or conclusion.
Development	The essay uses specific facts and details to develop an engaging idea reflecting depth of thought.	The essay uses relevant details to develop a central idea.	The essay does not use relevant details to develop a central idea.

NAME: _____

DATE: _____

14.1 **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 where you live? Use your research skills to find out!

NAME: _____

DATE: _____

14.2 **Activity Page**

My Presentation Checklist

	To Do *Add checkmark when complete*
☐ 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: _____

Audience Feedback

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

NAME: _____

DATE: _____

15.2 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.

_____

_____

_____

_____

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ELEMENTARY LITERACY PROGRAM

Grade 4 | **Unit 8** | Activity Book

Energy

ISBN 9781636029511

Amplify. TEXAS
ELEMENTARY LITERACY PROGRAM

ENGLISH

Grade 4

Unit 8 | Image Cards

Energy

ISBN 9781636029504

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Given the timeline for development, errors are to be expected. If you find an error, please email us at **texashomelearning@tea.texas.gov.**

Printed in the USA
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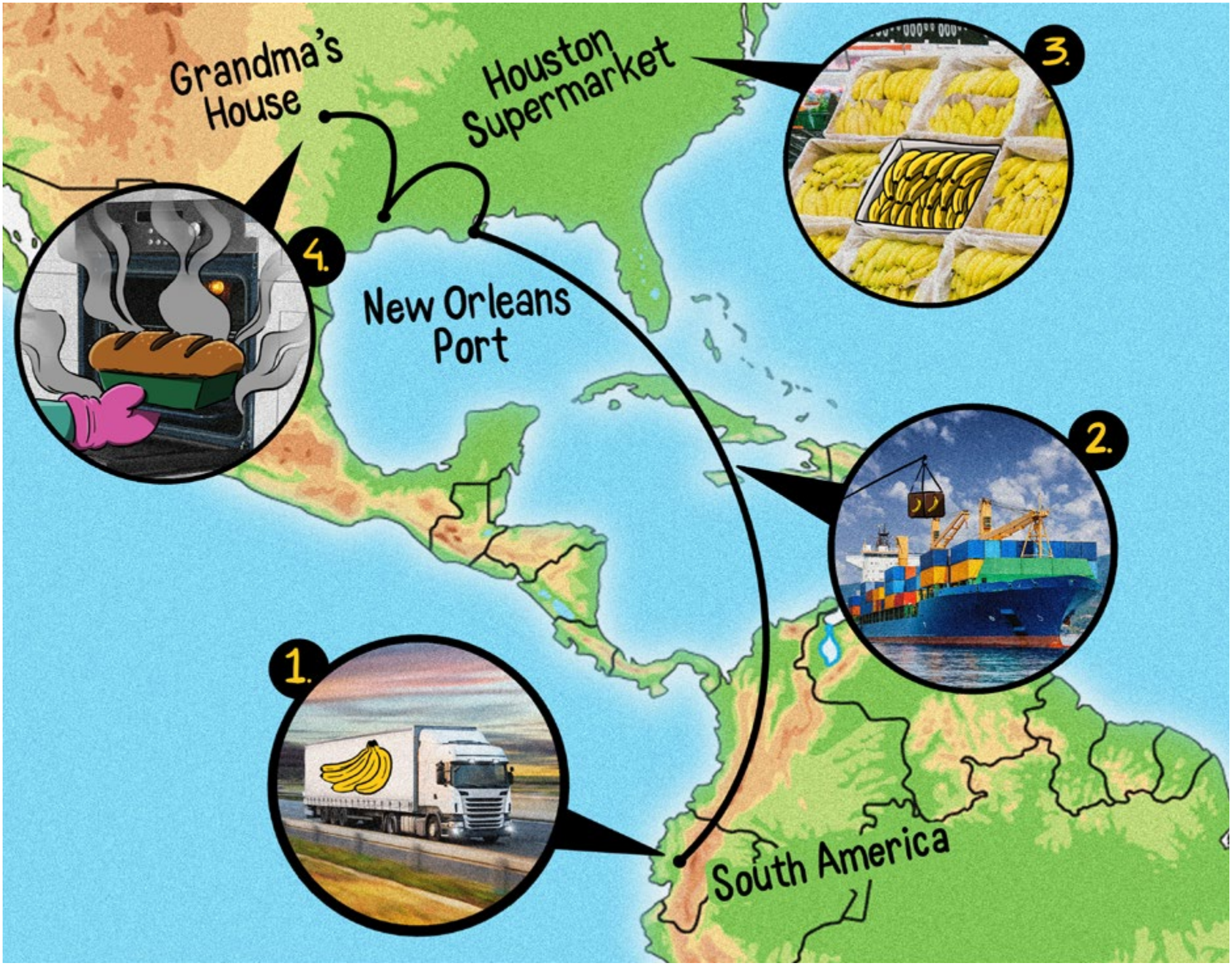
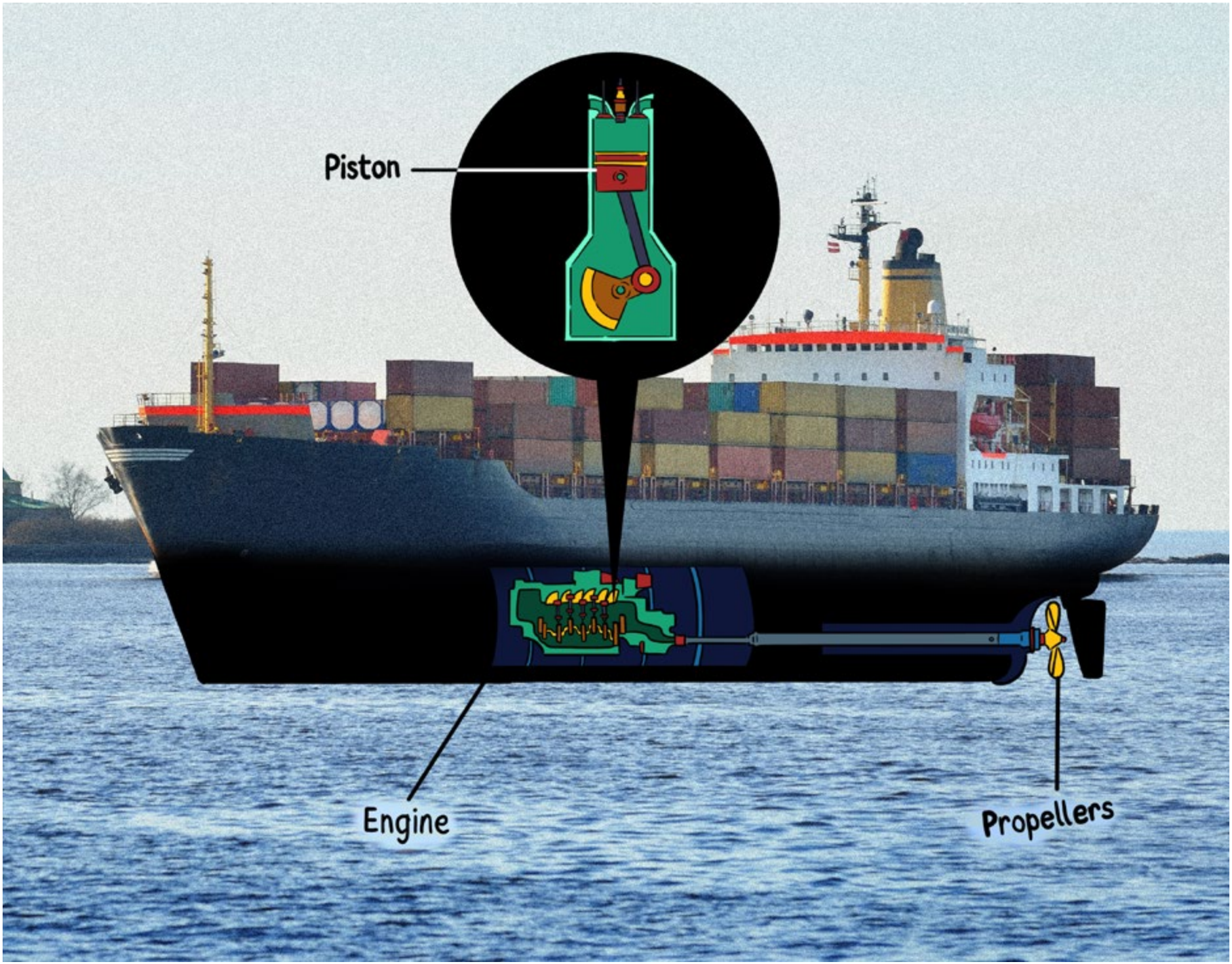
Energy: Past, Present, and Future 1A-1


Grandma's House
Houston Supermarket
3.
4.
New Orleans Port
2.
1.
South America

Energy: Past, Present, and Future 1A-2

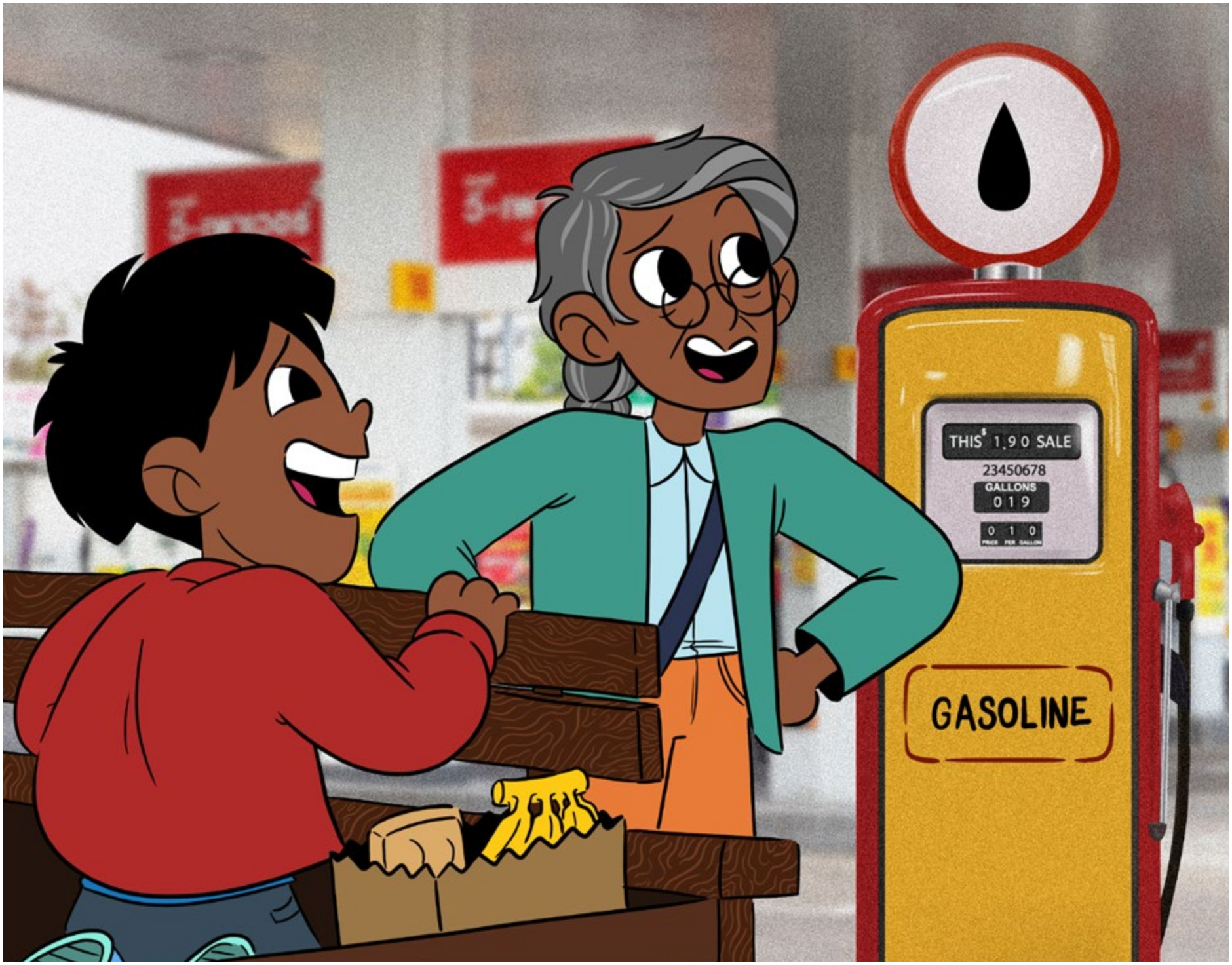

Piston
Engine
Propellers

Energy: Past, Present, and Future 1A-3


OFFICE
25 miles


AMBULANCE

Energy: Past, Present, and Future 1A-4


THIS $ 1.90 SALE
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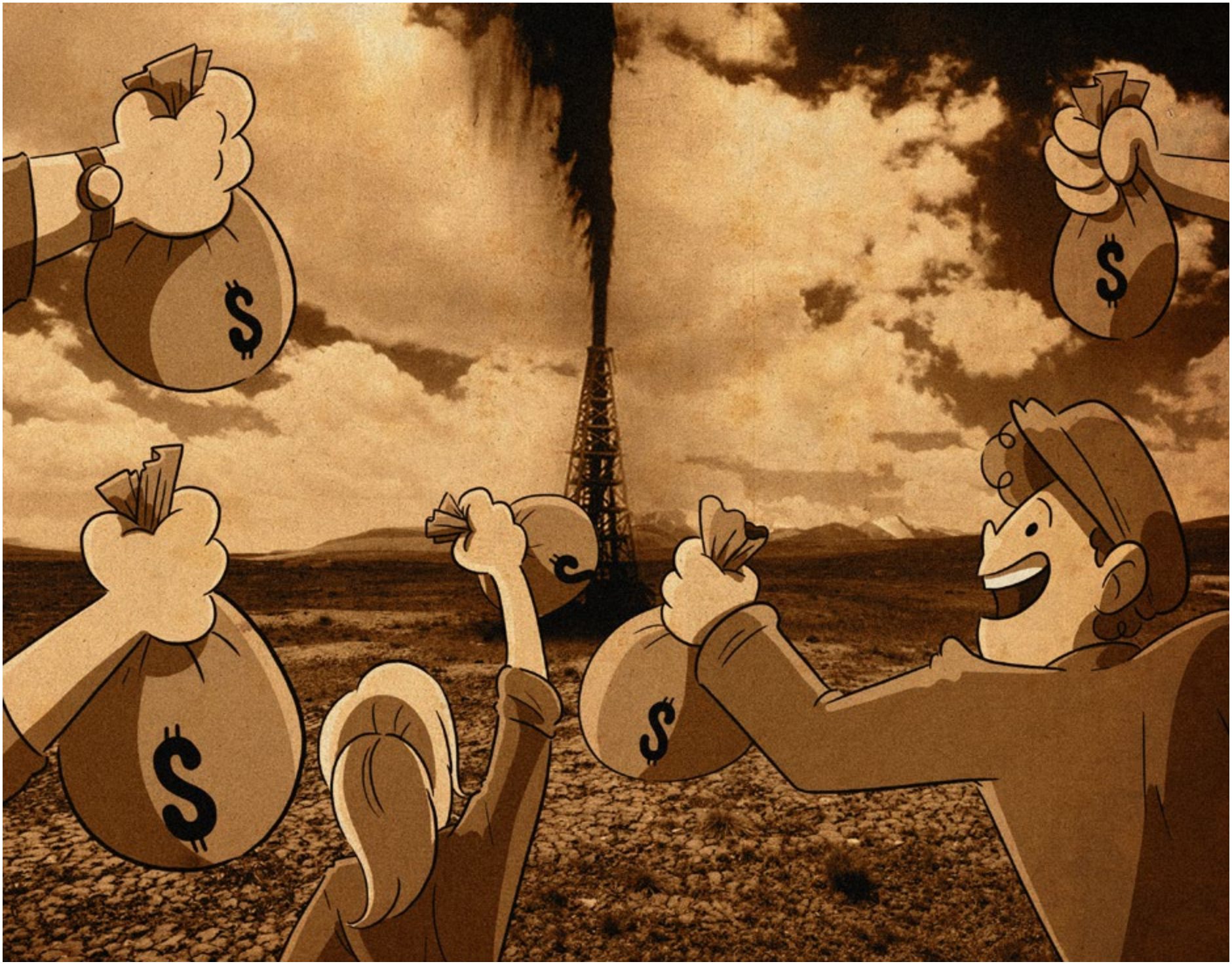
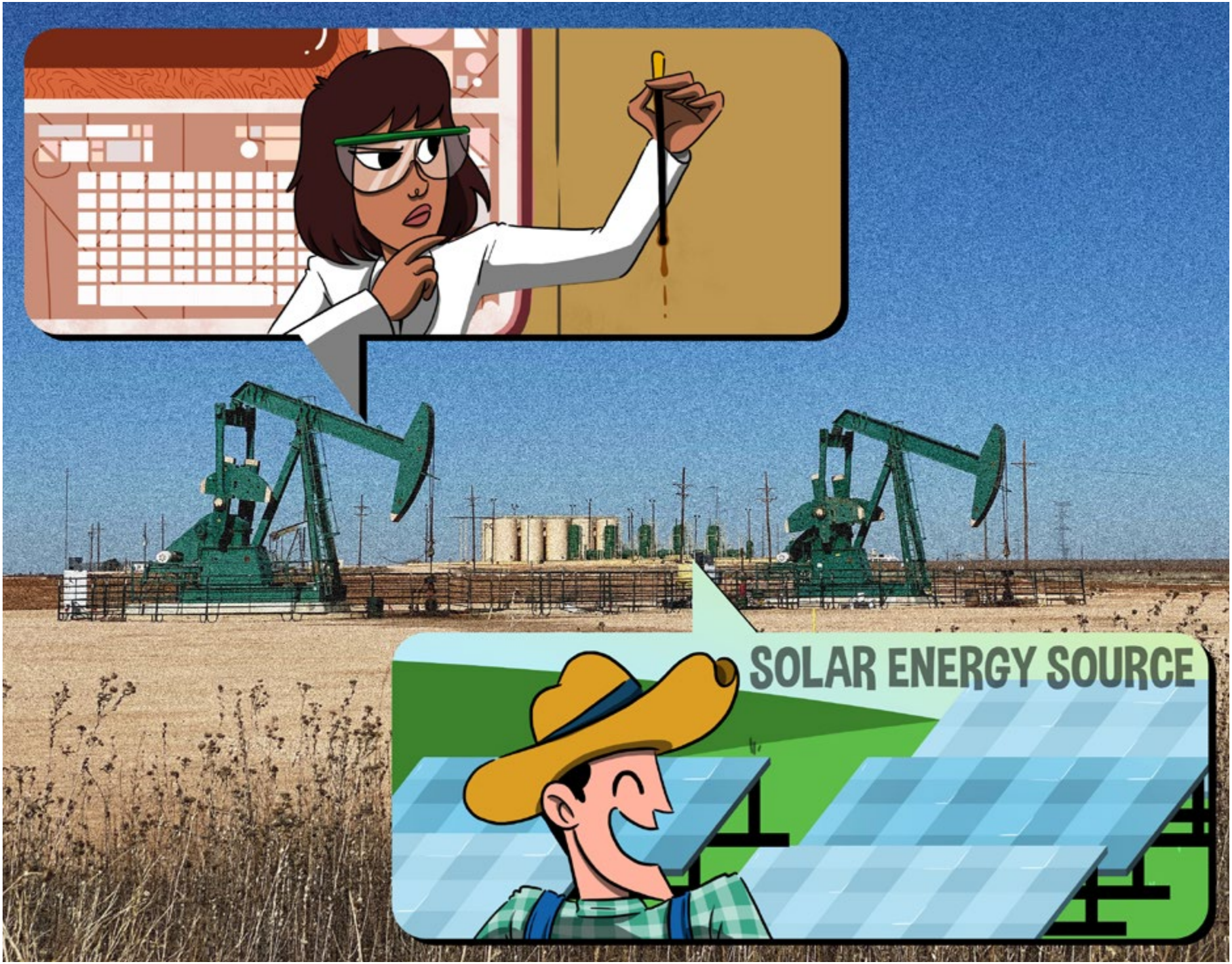
Energy: Past, Present, and Future 1A-5



Energy: Past, Present, and Future 1A-6

Energy: Past, Present, and Future 1A-7

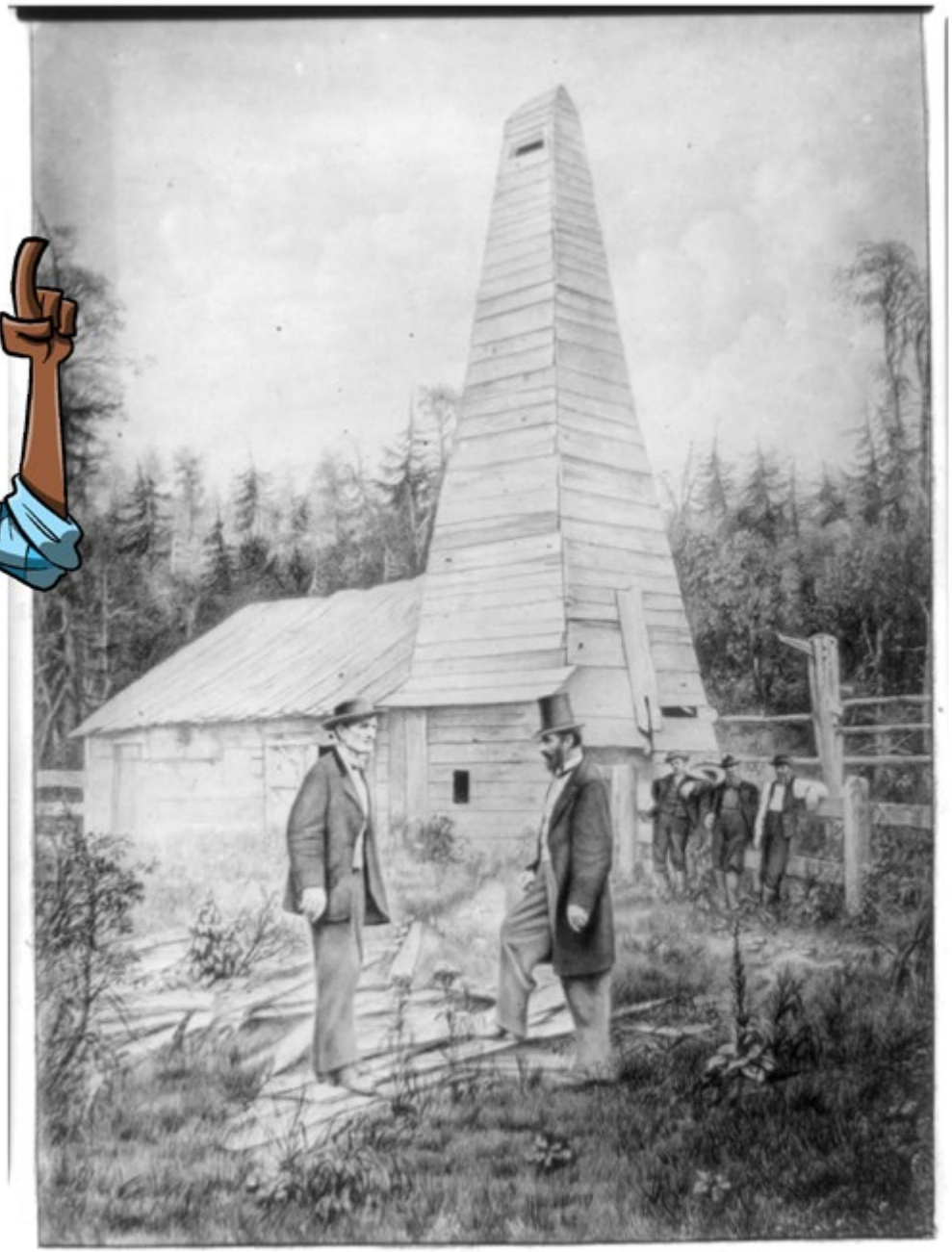

SOLAR ENERGY SOURCE

Energy: Past, Present, and Future 1A-8

Energy: Past, Present, and Future 1A-9

#86 Heywood #2 Gusher.

Energy: Past, Present, and Future 3A-1



Energy: Past, Present, and Future 4A-1

RED-HOT, A TYPICAL OIL-TOWN, IN 1870.

Energy: Past, Present, and Future 5A-1

Energy: Past, Present, and Future 6A-1

Energy: Past, Present, and Future 7A-1

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ELEMENTARY LITERACY PROGRAM
LECTOESCRITURA EN ESPAÑOL

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Schools

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Amplify. TEXAS
ELEMENTARY LITERACY PROGRAM
LECTOESCRITURA EN ESPAÑOL

Grade 4 Unit 8: Energy

This unit is based around authentic text. There is no free, digital Reader component for the unit.

There are two options for accessing the texts students will need to read:

Option 1: Purchase the set of books from Amplify (subject to availability). To purchase the books, please contact your Amplify sales representative directly or email texas@amplify.com.

Option 2: Source the texts independently online, at a local library, or at a local bookstore. Below is the list of texts this unit is based on.

Text Title	Excerpts	Author
Buried Sunlight: How Fossil Fuels Have Changed the Earth ISBN: 9780545577854	N/A	Molly Bang and Penny Chisholm
Energy Island: How One Community Harnessed the Wind and Changed Their World ISBN: 9781250056764	N/A	Allan Drummond
Oil Rig Workers: Getting the Job Done ISBN: 9781725300088	N/A	Jill Sherman
The Boy Who Harnessed the Wind: Picture Book Edition ISBN: 9780803735118	N/A	William Kamkwamba and Bryan Mealer
"Clean Energy"	N/A	ReadWorks passage
"Energy for Life"	N/A	ReadWorks passage
"Houston Affects the Earth"	N/A	ReadWorks passage

Note: In addition to the trade books used in this unit, teachers will need access to copies of digital texts from the ReadWorks website, which is free to use for educators.

Amplify. TEXAS
ELEMENTARY LITERACY PROGRAM

Welcome!

Grade 4, Unit 8
Energy

In this unit, students will learn about energy in the United States.

What's the story?

Students will follow the story of **energy development** in the United States, starting with the **oil boom** in Beaumont, Texas and ending with **today's energy needs**. They will also **conduct research**, putting them in the shoes of **future energy innovators**.

What will my student learn?

The students will learn about **innovators** of the **past** and **present**. They will read about current energy practices, and young energy **changemakers**. These include 19th century engineers who developed techniques to extract fossil fuels still used today, a Danish island run entirely by wind, and a young boy in Malawi who brought energy to his village with found materials.

Students will develop **analytical reading skills** as they examine the challenges of early energy innovators. Throughout the unit, they will conduct **research** using the internet and classroom resources to **identify and gather information** from a variety of sources. Students will engage in a **writing process** to produce **argumentative essays** and **multimodal presentations** including an **energy proposal**.

Conversation starters

Ask your student questions about the unit to promote discussion and continued learning:

1. What uses energy in our home?
   Follow up: What kind of energy is used? (batteries, fossil fuels, renewable energy)
2. Where does oil come from?
   Follow up: How do they remove oil from the Earth?
3. Have you ever had to make something in order to solve a problem?
   Follow up: What did you create? What did you learn from that experience?
4. What do you think will be the next big innovation in energy?
   Follow up: Do you think how we will use energy in the future will be different from today? How?

Name: _____ Date: _____

Amplify. TEXAS ELEMENTARY LITERACY PROGRAM

Grade 4

Unit 8, Lesson 5: Describe one or more effects from the lesson and defend it as a positive or negative event using evidence from the text in the response.

Name: _____ Date: _____

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Grade 4

Unit 8, Lesson 7: Write and submit one of your own research questions.

Name: _____ Date: _____

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Grade 4

Unit 8, Lesson 8: Define and provide an example of primary and secondary sources.

Name: _____ Date: _____

Amplify. TEXAS ELEMENTARY LITERACY PROGRAM

Grade 4

Unit 8, Lesson 9:
1. How many different sources have you used to take notes so far?

2. Do you find certain types of sources more useful than others?
(circle one) Yes/No
What makes a source useful for your research?

3. How many facts from your notes have been included in your essay so far?