



EXPEDITIONARY
LEARNING

Grade 6: Module 4: Unit 1: Lesson 4

Citing Evidence and Building Vocabulary:

“The Exterminator”



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Long-Term Targets Addressed (Based on NYSP12 ELA CCLS)	
I can cite text-based evidence to support an analysis of informational text. (RI.6.1) I can use resources to build my vocabulary. (L.6.6)	
Supporting Learning Targets	Ongoing Assessment
<ul style="list-style-type: none">• I can identify the argument and specific claims in a video about DDT.• I can determine the evidence used to support the argument and claims in a video about DDT.	<ul style="list-style-type: none">• Learning from Frightful’s Perspective: Chapter 4 (from homework)• Text Walk Scavenger Hunt recording form• Scientific vocabulary identified in “The Exterminator”



Agenda	Teaching Notes
<ol style="list-style-type: none"> 1. Opening <ol style="list-style-type: none"> A. Engaging the Reader: Learning from Frightful’s Perspective (10 minutes) B. Unpacking Learning Targets (3 minutes) 2. Work Time <ol style="list-style-type: none"> A. Exploring the Text: Side Bars and First Read of “The Exterminator” (15 minutes) B. Getting the Gist: Second Read of “The Exterminator” (10 minutes) C. Vocabulary: Introduction to Scientific Terminology (5 minutes) 3. Closing and Assessment <ol style="list-style-type: none"> A. Exit Ticket: Adding Scientific Terminology to the Scientific Word Wall (3 minutes) 4. Homework <ol style="list-style-type: none"> A. Read Chapter 5, “Frightful Peregrinates.” Complete Learning from Frightful’s Perspective: Chapter 5. 	<ul style="list-style-type: none"> • This lesson continues the routine for discussions and vocabulary development for <i>Frightful’s Mountain</i>. Build on existing norms and routines for collaborative work in your classroom. Discussion is vital while students work with text. • Students work in triads and share responses to the Chapter 4, “The Wilderness Tests the Eyases” focus question. Share new “Words I Found Difficult” and add to their vocabulary. Cold call students to share their Chapter 4 responses with the whole class. This routine helps students engage independently and immediately, and it also helps students develop understanding of the text. • Students are introduced to the article “The Exterminator” by focusing on the text features. This helps students get the gist of this article. The use of text features helps increase understanding of an author’s argument, which is particularly important as students become more independent in identifying arguments, claims, and evidence. These are skills the students will use in future lessons to make their own arguments and claims supported with evidence. • This lesson includes a read-aloud first reading of “The Exterminator,” followed by a second reading. During the second reading, students read closely for scientific words. • In advance: <ul style="list-style-type: none"> – Create a Scientific Word Wall for scientific words. Include category headings so students can add words to the Scientific Word Wall in future lessons. Categories include: Chemicals, Disease, Processes, Sciences/Scientists, Living Things, Other. • Post: Learning targets.



Lesson Vocabulary	Materials
text feature; gist, scientific terminology, captions, sidebars; exterminator, pesticide, malaria, parasite, vector(s) (1); insecticide, ecologist, accumulated, resistant (3); toxic, agriculture, environment, eradicating (4)	<ul style="list-style-type: none">• <i>Frightful's Mountain</i> (book; one per student)• Dictionaries (one per triad)• Equity sticks• “The Exterminator” article (one per student)• Document camera• Scientific Word Wall (new; teacher-created on chart paper)• Sticky notes (four or five per student)• Learning from Frightful's Perspective: Chapter 5 (one per student)



Opening	Meeting Students’ Needs
<p>A. Engaging the Reader: Learning from Frightful's Perspective (10 minutes)</p> <ul style="list-style-type: none">• Be sure students have their text, <i>Frightful's Mountain</i>.• Invite students to join their triads. They should share their responses to the focus question for Chapter 4, “The Wilderness Tests the Eyases.” Remind students of their focus question for the chapter:<ul style="list-style-type: none">* “What ‘signs in nature’ signal the falcon that it is time to migrate?”• Each student should share one signal in nature that peregrine falcons use to know when it’s time to migrate and include evidence found in the text. Listen for: “The days become shorter,” “the temperatures are changing,” “their food is diminishing or become in short supply as they migrate.”• After sharing these signals, direct students to share one of the words from Frightful’s Mountain that they added to their “Words I Found Difficult.” Members of triads should then collaborate to determine the meanings of the words. Both dictionaries and context clues may be used. Add definitions to the Chapter 4 “Words I Found Difficult.” Include page numbers where the words were found in Frightful’s Mountain.• After sharing these signals, direct students to share one of the words from Frightful’s Mountain that they added to their “Words I Found Difficult.” Members of triads should then collaborate to determine the meanings of the words. Both dictionaries and context clues may be used. Add definitions to the Chapter 4 “Words I Found Difficult.” Include page numbers where the words were found in <i>Frightful's Mountain</i>.• Circulate to observe students’ shared responses and written responses. Make note of students who begin work easily and collaborate with triad members and those who may need support.• Ask students to stop where they are with their responses. Cold call students to share responses with evidence to the focus question with the whole group.• Congratulate students for working collaboratively and practicing using evidence from the text.	<ul style="list-style-type: none">• Some students may benefit from teacher support to discuss signals for migration and provide evidence to support it.• Posting sentence starters for class discussions gives students an entry point for clearly conveying their responses. Consider posting phrases such as: “One signal that peregrine falcons use is ...” and “On page #___, I noticed ...”• Reviewing academic vocabulary words benefits all students developing academic language.



Opening (continued)	Meeting Students’ Needs
<p>B. Unpacking Learning Targets (2 minutes) Direct students’ attention to the learning targets.</p> <ul style="list-style-type: none">• Use a total participation technique, such as equity sticks, to invite students to read today’s learning targets:<ul style="list-style-type: none">* “I can get the gist of the informational article ‘The Exterminator.’”* “I can collect scientific vocabulary by reading ‘The Exterminator.’”• Tell students that today they will practice close reading skills by reading for the gist and looking for scientific terminology in “The Exterminator.”	
Work Time	Meeting Students’ Needs
<p>A. Exploring the Text: Side Bars and First Read of “The Exterminator” (15 minutes)</p> <ul style="list-style-type: none">• Tell students that they will take a “text walk” of the article. “The Exterminator” has one important text feature: <i>sidebars</i>, which are sections of the text set off from the body of the text. Students will read these in Lesson 6 and examine how information in the sidebars. contributes to the author’s argument.• Explain that authors use text features such as sidebars for specific purposes. These features often add to the author’s argument in a different way than the main article.• Distribute “The Exterminator” to the students.• Ask students to skim the article briefly, paying attention to the section headings, the first sentence of each section, and the sidebars. Invite students to turn and talk:<ul style="list-style-type: none">* “Based on skimming the article, what is the article going to be teaching us about?”• Listen for students to notice the consistent pattern that each section has something to do with malaria.• Tell students you will read the article aloud, skipping the grey side bars, which you will return to in a future lesson.• Read the article aloud as students read along.	



Work Time (continued)	Meeting Students’ Needs
<p>B. Getting the Gist: Second Read of “The Exterminator” (10 minutes)</p> <ul style="list-style-type: none">• Explain that because the article is about disease and the use of pesticides, it includes many scientific words. This type of reading requires effort and concentration.• Building knowledge of science words makes reading easier and more engaging. It also provides a foundation for understanding important issues. “The Exterminator” has many vocabulary words particularly connected to life science. Tell students that they will dig into the scientific vocabulary in this article a little later in this lesson.• Invite students to reread “The Exterminator” independently. As students reread, and annotate the article for the gist, invite students to look for words related to science. In each section of the article, ask students to identify scientific words. Students circle or highlight words in the article or record words on paper.• While students are looking for scientific words, circulate to observe which students may need guided support.	
<p>C. Vocabulary: Introduction to Scientific Terminology (5 minutes)</p> <ul style="list-style-type: none">• Introduce the Scientific Word Wall. Explain that students will encounter scientific terminology not only in “The Exterminator,” but also in other informational texts, videos, and in <i>Frightful’s Mountain</i>. To increase scientific knowledge, words will be added to the Scientific Word Wall throughout the module.• Distribute four or five sticky notes to each student. Ask students to share the scientific words they identified in the article with a partner. Partners should compare the words they circled, find common words, and write those words on the sticky notes. Students reread the words in context and try to determine the meaning of the word.• Invite students to look at the word categories on the Scientific Word Wall. Introduce each of the categories: Chemicals, Disease, Processes, Science/Scientist, Living Things, Other.• Model using the word categories by using words from the “The Exterminator.” For example a chemical is DDT, a disease is <i>malaria</i>, a process is <i>accumulate</i>, a scientist is <i>ecologist</i>, a living things is parasite.• Ask partners to discuss under which category their words might fit	



Closing and Assessment	Meeting Students’ Needs
<p>A. Exit Ticket: Adding Scientific Terminology to the Scientific Word Wall (3 minutes)</p> <ul style="list-style-type: none">• Ask pairs to add at least three of their scientific words to the Scientific Word Wall, placing their sticky notes with the words under the category heading that they feel best fits each word.• Preview homework.	
Homework	Meeting Students’ Needs
<ul style="list-style-type: none">• Read Chapter 5, “Frightful Peregrinates.” Complete Learning from Frightful’s Perspective: Chapter 5.	



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Supporting Materials



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“The Exterminator”

Can an old pesticide that is banned in most countries defeat one of the world’s worst disease?

By Kirsten Weir

Few Americans ever give much thought to malaria. That wasn’t always so. Malaria once infected—and killed—many people in the United States. During the Civil War, more than a million soldiers fell ill with the disease.

By the middle of the 20th century, malaria had been wiped out in the United States, Canada and northern Europe. But it continues to be a serious health problem in many tropical countries. Malaria kills an estimated 2 million people every year, most of them children under age 5. Despite an international effort to control the disease, malaria rates in Africa have risen over the past few years. “It’s going in the wrong direction,” said Roger Bate, the director of Africa Fighting Malaria, a nonprofit research and advocacy group.

Bate is one of several health officials now pushing for broader use of DDT (*dichlorodiphenyltrichloroethane*), a chemical that played an important role in kicking malaria out of the United States. They argue that DDT is the best option available for saving lives. But DDT is a touchy subject because it has been banned in the United States and many other countries for decades.

BAD AIR

People once believed that breathing nasty swamp air caused malaria. In fact, the word *malaria* is Italian for “bad air.”

Toward the end of the 19th century, scientists identified the true cause: a single-celled parasite they named *Plasmodium*. About the same time, scientists also discovered that mosquitoes act as *vectors* for the parasite, passing it on when they bite people. A vector is an organism that spreads disease-causing agents from host to host without harm to itself. (See “A Parasite’s Circle of Life,” page 6).

The malaria parasites need warm temperatures to develop inside mosquitoes, and the balmy southeastern United States was once hit hard by the disease. Malaria existed nearly everywhere mosquitoes did. During steamy summers, the disease reached as far north as Montreal. Changes in living habits—a shift toward city living, better sanitation, and the use of window screens—were largely responsible for the eradication of malaria, but DDT also played a part. DDT is an



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insecticide, a chemical that kills insects. In the 1930s and 1940s, when the U.S. government made a serious effort to wipe out malaria, DDT was one of its preferred weapons. It was sprayed on swamps and other wet areas where mosquitoes bred. Small amounts were also applied to some household walls in rural communities.

By 1951, malaria was gone from the United States, but DDT was still used for other purposes. Huge quantities of it were sprayed by airplane on farmland to kill the insect pests that feasted on cotton and other crops. At first, no one worried about the possible effects of the chemical on the environments. Then in, 1962, an ecologist named Rachel Carson captured the country’s attention with her book, *Silent Spring*, which detailed the dangers of DDT.

Carson described the damage done by DDT, which persisted in nature for years without breaking down. The chemical first built up in the tissues of fish. It then accumulated inside eagles and other birds of prey that ate the fish. It caused the birds’ eggshells to become thin and brittle. The eggs cracked under their own weight, sending bird populations into a nosedive. The U.S. government responded by banning DDT in 1972.

DOUBLE WHAMMY

Many other countries followed suit, including a number of nations that relied on DDT for malaria control. A handful of malaria-ridden countries have continued to use DDT to control the disease. But even in those countries, DDT is no longer dumped in mass quantities onto the land. It is applied only to the inside walls of houses. Because malaria mosquitoes bite after dusk, protecting people inside their homes

SERIOUSLY SICK

Malaria begins with flulike symptoms: fever, sweating, chills, headaches, muscle aches, and nausea. The symptoms come and go every 48-72 hours. Without treatment, the disease can get much worse. The parasites infect and destroy red blood cells, which can lead to severe *anemia*, a condition in which the concentration of red blood cells is too low to supply enough oxygen to the body’s tissues. Infected blood cells can also clump together and stick to the body’s blood vessels, blocking blood flow to the brain. The result is often blindness, brain damage, or death.

Drugs are available to treat malaria, though many are expensive. To be most effective, the drugs must be taken before the disease becomes severe. Poor families in places such as rural Africa often cannot afford the drugs, or they put off going for treatment until it’s too late.

Such *prophylactic*, or preventive, medications are also available. When given to uninfected people, they attack the parasite if it ever gets into the body. But the prophylactic drugs are expensive and hard on the body. Travelers can safely taken time for a few weeks or months, but the pills are too toxic for people living in malaria-affected countries to tolerate for long periods of time.



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can be very effective. DDT packs a double whammy: It repels most mosquitoes and kills those that get too close. It is by far the cheapest insecticide available and lasts twice as long as the alternatives.

South Africa was one nation that continued to use DDT after the United States banned the chemical. By 1996, South Africa had fewer than 10,000 annual malaria deaths. That year, the country switched from DDT to other insecticides. The new insecticides were also widely used in farming, and the overexposed mosquitoes quickly became resistant to the chemicals. By 2000, the number of deaths from malaria had risen to more than 60,000. At that point, South Africa turned back to DDT. Within three years, malaria infections dropped nearly to 1996 levels. In other countries where DDT has been used, from Ecuador to Sri Lanka, it has had similar positive effects.

Today, only about 20 countries use DDT for malaria control, according to Roger Bate. Many more could benefit, he says.

PUBLIC FEAR

Why don't more countries use the powerful insecticide? “DDT probably has more opponents than any other insecticide because of its historic use,” explained Bate. “But it’s mistaking the point!”



“The Exterminator”

All of the problems associated with it in the past are down to the mess that was made of it in farming.”

Some wealthy countries worry about the double standard of supporting the use of a chemical abroad that they’ve banned at home. The memory of *Silent Spring* and dying bald eagles also lingers. Most of the money that tropical countries use to fight malaria comes from international donors. Many of those donors are reluctant to fund the use of a chemical that scares so many people.

“Why [DDT] can’t be dealt with rationally, as you’d deal with any other insecticide, I don’t know,” Janet Hemingway, the director of the Liverpool School of Tropical medicine, told *The New York Times*. “People get upset about DDT and merrily go and recommend an insecticide that is much more toxic.”

Bate and many of his colleagues argue that the public’s fear of DDT is unfounded. Billions of Americans were exposed to high amounts of DDT when it was used in agriculture, Bate said, without any harm to human health. And many scientists agree that the small amounts needed for malaria protection would likely have no significant effect on the environment.

Meanwhile, malaria is not going away. Some scientists estimate that malaria has killed half of all the people who have ever lived. Today, the disease claims two lives every minute. The most severely affected countries are in Africa, where the disease takes the life of one in every 20 children.

Some scientists worry that the situation could become

KILLER GENES

Scientists have tried for decades to develop a vaccine to prevent malaria, without success. Dozens of different species of mosquito carry the parasite inside them, infecting people with their blood-sucking bites. To complicate things further, four different *Plasmodium* parasites cause malaria in humans. Because so many different species of mosquito and parasite are involved, and because *Plasmodium*’s life cycle is so complex, a vaccine has so far been impossible to produce.

Still, researchers haven’t given up. Many are looking for solutions in modern biotechnology. In 2002, scientists sequenced the *genomes* of the most common malaria parasite, *Plasmodium falciparum*, and one of its most common carriers, the mosquito *Anopheles gambiae*. A genome is the total genetic information in an organism.

Theoretically, scientists could use that genetic knowledge to tinker with the genome of the mosquito to make its immune system kill the parasite. Or researchers could tweak the genome of the parasite itself to render it less infectious or less deadly. Such tasks would take years to accomplish, if they can be achieved at all. But the genomes offer one more target in the fight against malaria.



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even worse. As global warming heats up the planet, mosquitoes are spreading into areas where they once could not survive. Hotter temperatures also allow the *Plasmodium* parasite to develop faster inside the mosquito, infecting more people in a short amount of time.

Most scientists now think that eradicating malaria is impossible, given the complicated life cycle of the parasite. But chipping away at the disease is possible, and DDT has proved itself to be a valuable tool.

“The big picture is bad, but there are examples out there of what works,” Bate said. “We need every tool in the arsenal!”

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Learning from Frightful's Perspective:
Chapter 5

Theme: How leaders help their people
Focus: Leaders help people to make change

<p>Focus Question: As the weather changes, many other changes occur in Frightful's environment. These changes and the need to survive pull her in two different directions.</p> <p>What two directions is Frightful pulled in? Which direction does Frightful choose? Use evidence from the text to support your thoughts.</p>	<p>Evidence from the Text:</p>	
<p>Chapter 5: "Frightful Peregrinates"</p> <p>Words I Found Difficult:</p> <p>Glossary: current—noun: air or water moving continuously in a certain direction migration—noun: movement from one place, region, or climate to another</p>	<p>Name the two directions and Frightful's choice. My Thoughts:</p>	