GRADE 5 -- NYS Engage Text Modules		Resource (copies)	TeachingBooks Link
5.1	Esperanza Rising	SNAP (51)	http://www.teachingbooks.net/qlc2aua
	"Universal Declaration of Human Rights" / United Nations	Office of the High Commissioner for Human Rights	
	"American Heroes" / Readers Theater Script	PDF From Expeditionary Learning	
5.2a	The Most Beautiful Roof in the World / Kathryn Lasky	SNAP (25)	http://www.teachingbooks.net/qlpunz7
	"Interview with Sloth Canopy Researcher: Bryson Voirin" / UntamedScience	http://www.thewildclassroom.com/biomes/scientistprofile/scientists/bryson.html	
	"Hawaii's Endangered Happy Face Spider"	PDF From Expeditionary Learning	
	"Live Online Interview with Eve Nilson" / Scholastic	PDF From Expeditionary Learning OR Teacher Scholastic	
	"Great Bear Rainforest Remote Camera Project" / Twyla Roscovich	http://vimeo.com/9433768	
	"Meg Lowman Interview Questions and Answers" / Marian Smith Holmes	http://www.smithsonianmag.com/science-nature/interview-margaret-lowman-140079805/	
	"The Wings of a Butterfly: A Tale of the Amazon Rainforest" / Aaron Shepard"	http://www.aaronshep.com/stories/030.html	
	24 Questions with NRC Directory Dr. Meg Lowman	Visit Raleigh Blog	
	Dr. Meg Lowman official website	Canopy Meg	
5.2b	The Boy Who Invented TV / Kathleen Krull		http://www.teachingbooks.net/qltbeu3
	The Electric Motor / Expeditionary Learning	PDF From Expeditionary Learning	
	Ingenious Inventions by Women: The Windshield Wiper & Paper Bag Machine / Expeditionary Learning	PDF From Expeditionary Learning	
	"Dr. James Naismith, Inventor of Basketball	Kansas History	
	First College Basketball Game	Americas Library	
	Big Thinkers: Was Steve Jobs this Generation's Thomas Edison?	PDF From Expeditionary Learning	
	Steve Jobs	Time for Kids	
	Television Takes the World by Storm (video)	History Modern Marvels	
	The TV Guy	I Love History	
	TV Turns On / Claudia Reinhardt & Bill Ganzel	Living History Farm	
	How Television Changed the World / Robert Hudson	Excerpt PDF From Expeditionary Learning (World Book Online Infofinder)	
	Garrett Morgan: Inventor Hero / Paula Morrow	PDF From Expeditionary Learning	
	Transportation, from the Soap Box Derby to the Jeep: first Automatic Traffic Signal	The Ohio Academy of Sciences, Heartland Science	
	The Twofold Genius of Garrett Morgan	Social Studies for Kids	
	Garrett Augustus Morgan	Enchanted Learning	
	Airplane (Grolier Online New Book of Knowledge NOVEL Databases	Excerpt PDF From Expeditionary Learning (see your librarian for full article)	

GRADE 5 -- NYS Engage Text Modules		Resource (copies)	TeachingBooks Link
5.2b	Invention of the Airplane / Nakate Shashank	Buzzle	
	Wright Brothers: Inventors of the Airplane	Ducksters Technological Solutions, Inc	
	How Did We Learn to Fly Like Birds?	National Aeronautics and Space Administration	
5.3a	Promises To Keep: How Jackie Robinson Changed America / Sharon Robinson	SNAP (25)	http://www.teachingbooks.net/qloi8g4
	"It's Not Just a Game!" / Lori Calabrese / Odyssey July/August 2009	PDF From Expeditionary Learning	
	"Roots of American Sports" / Allosaurus Publishers Ally's Multicultural History & How It Relates to Us today, 2005	PDF From Expeditionary Learning	
	"Sports in America" / U.S. State Department	http://usa.usembassy.de/sports.htm	
5.3b	The Inuit Thought of It: Amazing Arctic Innovations / Alootook Ipellie	SNAP (30)	http://www.teachingbooks.net/qlzqhr2
5.4	Dark Water Rising / Marian Hale	SNAP (2 Audio Books)	http://www.teachingbooks.net/qlt479w
	Eight Days: A Story of Haiti	SNAP (25)	
	Earthquake (Grolier Online, The New Book of Knowledge NOVEL database)	Excerpt PDF From Expeditionary Learning (see your library for full article)	
	How Does a Hurricane Form?	SciJinks	
	Earthquakes / Karen Carr	Science for Kids	
	Hurricanes	University Corporation for Atmospheric Research	
	A Rocky Road Ahead / Scholastic News Edition Feb. 2010	PDF From Expeditionary Learning	
	President Obama, former President Bill Clinton, and Former President George W. Bush "On the Recovery and Rebuilding Effort in Haiti"	The White House	
	On Shaky Ground/? Britt Norlander Scholastic Action May 10, 2010	PDF From Expeditionary Learning	
	Haiti Earthquake Relief One-Year Report	Red Cross	
	Red Cross Disaster Relief	Red Cross	
	Help for Haiti / Weekly Reader News Feb 3, 2010	PDF From Expeditionary Learning	
	Surface Amplified Haiti Earthquake / Current Science Jan. 13, 2011	PDF From Expeditionary Learning	
	The Red Cross at a Glance	How Stuff Works	

Readers Theater Script: "American Heroes"

Script 1 - Cast:
Narrator
Paul Revere
Frederick Douglas
Susan B. Anthony

Narrator: Today, you will be introduced to three American Heroes. Their stories begin at different times in history and in different places, however, you are learning about them because they have made important contributions to our country. I will let them introduce themselves to you.

Paul Revere: Hi, my name is Paul Revere. It is a French name, because my parents were born in France. My father came to North America in 1715 when he was thirteen years old. He settled in Boston. He was a silversmith.

Frederick Douglas: Good day, my name is Frederick Douglass. I was born in Maryland in February of 1818. Unlike Paul Revere, I was born into slavery, but I managed to gain my freedom by boarding a train to New York.

Susan B. Anthony: Hello, my name is Susan B. Anthony, and I was born in Massachusetts on February 15, 1820, two years after Frederick Douglass. Douglass and I actually knew each other. We were both fighting for the same cause. We wanted freedom for all people. I grew up during a time when women had very few rights.

Source: Google search result for "readers theater scripts human rights" to link titled: (doc) "Readers Theater Script: American Heroes" (last accessed July 27, 2012).

Readers Theater Script: "American Heroes"

Script 2 - Cast:
Narrator
Paul Revere
Frederick Douglas
Susan B. Anthony

Narrator: Listen as these three American heroes tell how they impacted our history and expanded our rights and freedoms.

Paul Revere: Well, when I grew up, America was not the same as we know it today. There were only thirteen colonies, and we were ruled by the British. We did not have 50 states like we do now.

Frederick Douglas: And, when I was born, America was no longer ruled by the British, but things were still pretty bad. As I said before, I was born into slavery. It was illegal for slaves like me to learn how to read, but I didn't let that stop me. My first teacher was Sophia Auld. She was kind to me.

Susan B. Anthony: Well, although I was not a slave, I did not like the way some people were treated, especially women. They did not have the right to vote, to own property, or to get good jobs. So, I decided take a stand against the mistreatment of women.

Paul Revere: All of us had something we wanted to fight for. I decided that I was going to fight against the British for our independence. I learn a lot from the men and women who came to our silversmith shop. I heard stories about the complaints the colonists had against the British government, so, I joined a group called the Sons of Liberty.

Frederick Douglas: And I hated being enslaved, so I dressed up as a sailor and got aboard a train headed north. I was afraid I would be caught, but I got lucky, and was able to make it to New York.

Susan B. Anthony: Well, I became a Principal of an all girls' school, but I wanted to do more than that. I wanted to work for justice and fairness for all the people who were being treated badly.

Source: Google search for "readers theater scripts human rights" result to link titled: (doc) "Readers Theater Script: American Heroes" (last accessed July 27, 2012).

Readers Theater Script: "American Heroes"

Script 3 - Cast:
Narrator
Paul Revere
Frederick Douglas
Susan B. Anthony

Narrator: So, what were some of the things that made you guys famous?

Paul Revere: Ah, well, let me see. I know you have heard about the famous Boston Tea Party right? Anyway, this was when the colonists decided that they were going to protest the taxes that the British were making them pay. You know what they did? They dumped all the British tea into the Boston Harbor.

Frederick Douglas: Oh boy, I bet that made them angry! But, what I did was even more interesting. I gave hundreds of speeches on the evils of slavery. I also became part of the Underground Railroad that helped other slaves escape to freedom. I was a famous abolitionist. That just means, someone who wanted to get rid of slavery.

Susan B. Anthony: You were both very courageous! However, my good friend, Elizabeth Stanton and I formed the first political group for women called "The Women's National Loyal League." We also organized the National Woman Suffrage Association. Suffrage means the right to vote.

Source: Google search for "readers theater scripts human rights" result to link titled: (doc) "Readers Theater Script: American Heroes" (last accessed July 27, 2012).

Readers Theater Script: "American Heroes"

Script 4 - Cast:
Narrator
Paul Revere
Frederick Douglas
Susan B. Anthony

Narrator: That is all wonderful, but what else did you do?

Paul Revere: Well, I became famous for the midnight ride that I took from Boston to the towns of Lexington and Concord, Massachusetts. I had to warn the Patriot Militia that the British soldiers were coming. I was riding with William Dawes and Samuel Prescott. The battle at Lexington was the first battle of the American Revolution. When the war ended in 1783, the thirteen colonies had gained independence. We became the United States of America.

Frederick Douglass: I started a newspaper called, The North Star, and I worked with Susan B. Anthony and many others to end slavery and get more rights for women. President Lincoln and I became friends, because he was against slavery as well.

Susan B. Anthony: Well, I am proud to say that I was arrested for voting. And, because of my diligence, by 1920, the law was changed to allow women in every state to vote. So, every time you cast a vote, think of me!

Frederick Douglass: Hey, hey, don't forget, I am the first African American to get my picture on a postage stamp!
Paul and Susan: Way to go Frederick!

Narrator: Well, you are all famous! Thank you so very much for the contributions you have made to our American history. Because of your diligence and courage, you have made us proud.

Source: Google search for "readers theater scripts human rights" result to link titled: (doc) "Readers Theater Script: American Heroes" (last accessed July 27, 2012).

GRADE 5, MODULE 2A: UNIT 1, LESSON 4

Hawaii's Endangered Happy Face Spider
Written by Expeditionary Learning for instructional purposes
September 19, 2012

Author's drawing of the "Happy Face Spider"

#1	Meet *Theridion Grallator*, meaning "Happy Face Spider." This little *arachnid*, found in *Hawaiian* rainforests is quite small. It measures only 5 millimeters in length, at most!
#2	The Happy Face Spider's name comes from the *unique pattern* found on its pale-colored back. The marks resemble two circles that look like eyes. There is a *curved* shape below, similar to a smile.
#3	Some scientists think the spider may have developed these *strange markings* as a way to warn *predators*, such as birds. However, not all scientists agree on this *theory*. Some believe the *features* may do nothing to help the spider avoid its enemies.
#4	The Happy Face Spider generally tries to stay out of the *limelight*. It lives its life on the *undersides* of leaves, deep in the rainforest. This can make it difficult for scientists to *locate* and study.
#5	One scientist, studying the Happy Face Spider for nearly twenty years, is Dr. Geoff Oxford. In an interview with him from 2009, Dr. Oxford said the spider is very *difficult* to find due to the fact that it is in danger of *extinction*. He stated that the species was *under threat* from *non-native* animals brought to the islands.
#6	Because of the Happy Face Spider's *endangered* status it has become a *symbol* for all of Hawaii's *threatened* wildlife. In fact, *conservationists* have placed *images* of it on T-shirts, baseball hats, and even garbage trucks. They hope to use this as a way to bring *attention* to the loss of various *fauna* throughout Hawaii.

GRADE 5, MODULE 2A: UNIT 1, LESSON 4

Citations (for "Hawaii's Endangered Happy Face Spider")

http://en.wikipedia.org/wiki/Theridion_grallator "Theridion grallator" last updated 9/19/12
http://www.telegraph.co.uk/news/newstopics/howaboutthat/5199409/British-scientists-study-Hawaiian-happy-face-spider.html British scientists study Hawaiian happy face spider By Daily Mail Reporter 10:58AM BST 22 Apr 2009
http://hbs.bishopmuseum.org/good-bad/spider.html Bernice Pauahi Bishop Museum – Hawai'i State Museum of Cultural and Natural History, website
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Mid-Unit Assessment: Analyzing Part 1 of an Interview with a Rainforest Scientist

Excerpts from Part 1 of the "Live Online Interview with Eve Nilson"

Thank you for joining Scholastic News Zone's live interview with 15-year-old scientist Eve Nilson on Tuesday, April 23. The following is a transcript from that interview.

Q: What was your inspiration to study animals?
Eve: I have always had a fascination with animals and an interest in tropical rain forests and the tropics. Growing up in Alaska and studying whales with my mother, I spent a lot of time in nature and found them to be extremely interesting.

Q: Is it cool to be a scientist?
Eve: Yes, it has been an amazing experience waking up in the morning when I was in Brazil, waking up and seeing so many animals I've never seen before, and going out into the forest to study the frogs. Also, knowing that I'm making a difference, that's amazing to me. The students of today are interested in biology, and by spreading the word about the danger rain forests are in, I feel I am making a difference, which is a really good feeling.

Q: Did you travel alone?
Eve: Yeah, I traveled for the first two and a half months. I stayed in the forest alone in my hut. The scientists lived about a mile further down the road, so I wasn't completely alone.

Q: Where is the picture for the chat taken?
Eve: That is in front of the research station in Brazil, about 50 feet from my hut.

Q: Do you like snakes, tarantulas, reptiles, and turtles?
Eve: Yeah, I really like snakes. I like all of the animals except for mice. I'm really afraid of mice. Why? I don't know, I guess the way they sneak up on you. That's frightening. I had a bad experience as a kid when I reached into a cracker box and there was a mouse. I've been afraid ever since.

Eve Nilson displays a lizard she found sunning itself between two rocks by a stream in Brazil. The lizard was photographed so it could be identified later.
Photo Courtesy Eve Nilson

Q: Why did you want to study frogs?
Eve: I was offered a position studying frogs, but I also felt they were extremely important. They are an indicator species; they're extremely sensitive to the environment and its changes. Any rapid disappearance of frogs is a sign there's trouble in the environment. Also because frogs breathe through their skin. You're able to see more clearly the affects that pollution and acid have.

Mid-Unit Assessment: Analyzing Part 1 of an Interview with a Rainforest Scientist

Q: Did you ever get lost? Were you glad to be home? Did you ever get homesick? Were you ever threatened by an animal?
Eve: The first week I was extremely homesick and I called home. It was wonderful talking to my family. After that I was okay. I found it was really peaceful. I was never lost. A few times in the beginning I would be walking out alone at night and I'd hear noises. There's only so much you can see with a small flashlight. I got used to it. I got used to sleeping in the jungle at night. An animal did not threaten me, but I was followed by a jaguar. Its tracks were really fresh. A ranger went up after me and saw that the tracks were following me down. That was really intimidating knowing that a jaguar was just a few minutes behind me.

Q: Did you bring any animals back with you?
Eve: A bots fly bit my mother, and her ankle swelled up. My mom came to visit the last few weeks of my trip and got bit by a bots fly. Bots flies commonly bite cattle. She was a host for the bots fly. When the doctors did an incision in her foot and brought out the larva it was an inch long and ready to hatch. So she brought back an insect with her by accident! We're not allowed to bring back any plant or animal species. It's against Brazilian and U.S. law.

Q: Would the fly have hatched inside of your mother?
Eve: No, when it hatches, it breaks the skin and flies away. It would have hurt when it broke the skin. She got sharp pains in her foot when it moved around. It was in there six weeks. Doctors weren't exactly sure what it was. It was the first bots fly found in California.

Q: Do you plan to go to college? What do you want to study?
Eve: I definitely plan to go to college. Absolutely. That's my number one priority right now since I'm a junior in high school. I plan to major in biology, but I also want to study zoology because I'm so interested in animals in the rain forest.

Q: Why are you so interested in the rain forest over other regions of the world?
Eve: I've always had this fascination for the rain forest because of the high diversity of animals. When you are walking in the forest, you look up in the trees and see things you have never seen before in your life. I'm especially interested in the tropical rain forest. There are so many animals living in such a small region of the world. The rain forest can support such an extreme amount of diversity. I also like how pristine and beautiful the forest is when you are walking through and really appreciating nature.

Q: Why do they call the rain forest a *rain forest*?
Eve: Rain forests receive large amounts of rain every year. It's very lush and green because of the rain, which makes it a hot spot for biodiversity.

"The Electric Motor"

Written by Expeditionary Learning for instructional purposes.

You may not know it, but electric motors are everywhere! They are found in hundreds of devices that are used by people every day. Some alarm clocks use an electric motor. Refrigerators also run on an electric motor. Parts of the windshield wipers on cars, power tools, and computers all contain electric motors. Given how much we depend on the electric motor today, it's hard to even imagine what life was like before it was invented.

In the early 1800s, the main source for electricity was batteries. However, batteries cost a lot of money, so many people could not afford to have electricity in their homes. This led scientists to begin experimenting with other ways to create electricity.

It was 1821 when an English chemist named Michael Faraday designed an experiment in which he attached a magnet to the bottom of a wire. He hung the wire with the magnet from a hook and placed it directly over a bowl of liquid. He then connected a battery partway up the wire, between the magnet and where the wire met the hook. When Faraday turned the battery on, the wire began to spin. This experiment became the first example of a machine capable of generating electricity better than a battery. Faraday called it the electric motor.

Faraday's electric motor eventually led to Thomas Edison's construction of an electric power plant in New York City in 1882. Edison used the idea of the electric motor to figure out a way to generate electricity that people could buy. Edison's massive plant provided enough electricity to power 1,200 light bulbs, essentially allowing everyone to have access to reasonably priced electricity.

Many scientists continued to improve on these earlier versions of the electric motor, and the ongoing advancements have undoubtedly made our lives much simpler. So the next time you turn on the lights, dry your hair, or use a CD player, think about how lucky you are that the electric motor was invented!

"Ingenious Inventions by Women: The Windshield Wiper and the Paper Bag Machine"

Written by Expeditionary Learning for instructional purposes

Mary Anderson and Margaret E. Knight are two inventors you have probably never heard of. However, their ingenious ideas have made our lives both safer and simpler. Read on to learn more about how and why each of these brilliant women developed devices that we still rely on so much today.

Mary Anderson

Where does the idea for a great invention come from? Well, in the case of Mary Anderson it was developed purely from the desire to make people's lives safer.

It was the year 1902 when Mary Anderson traveled far from her home in Alabama and boarded a New York City streetcar. The snow and sleet pelted the car mercilessly. The driver struggled to see the road in front of him through the frost-caked glass. It was because Mary felt sorry for the driver and realized the potential danger to her fellow passengers that she was inspired to create a device that would make people's lives better. That invention was the windshield wiper.

At the time, the best option available was a split windshield. During bad weather, drivers would swing open their front window in the hopes that debris would slide off to clear their view. However, this design did not work very well. So Mary thought, "Why not create a device to remove the snow and ice completely?" Immediately, she began to draw up plans in her notebook.

Mary's final sketch became what we refer to today as "windshield wipers." Or, as she described in her patent application, "… an improvement in window-cleaning devices in which a radially-swinging arm is actuated by a handle from inside of a car-vestibule," which is just another way of saying there would be a lever inside the car that made an arm move across the glass of the windshield.

Unfortunately, manufacturers did not see the value of her idea and she allowed the patent to expire. Several years later, someone else saw Mary's idea. That person patented and sold the invention of windshield wipers to car companies far and wide. Today, we can all be grateful to Mary Anderson for this ingenious invention because it helps us see where we're going, even in the most inclement weather.

"Ingenious Inventions by Women: The Windshield Wiper and the Paper Bag Machine"

Margaret E. Knight

Whereas Mary Anderson's goal was to make people's lives safer, another inventor, Margaret E. Knight, set out to make people's lives easier. In the mid-1800s, Margaret Knight worked at the Columbia Paper Bag Company. Her job was to tie together stacks of handmade, flat-bottomed bags. Flat-bottomed bags took a long time to make, so they cost more than most people could afford. At the time, most people could only afford large wooden crates or poorly crafted envelope-shaped bags to transport their goods from the grocery store to their homes. So when Margaret had been on the job only a week she wondered, "Why can't flat-bottomed bags be made with a machine so they would take less time to put together and cost less money? Then everyone could afford them." Similar to Mary, Margaret's question led her to create a device that would improve people's lives.

Margaret was neither a scientist nor an engineer. However, because she had worked with machines most of her life, she understood how they worked and how to build them. She began sketching ideas for a new paper bag machine that would fold square-bottomed bags. Her next step was constructing and testing the various parts of her machine. Within a year, Margaret had built a complete and working model of her invention. Once her wooden model was complete, she hired a machinist to build one out of iron. She submitted an application for a patent along with the newest version of her "Paper Feeding Machine" in 1868.

Unlike Mary's idea, the value of Margaret's machine was recognized almost immediately. When a man named Charles Annan saw Mary's paper bag machine being cast in iron at the machinist's shop, he tried to steal the idea. Annan copied Margaret's invention and tried to file a patent. He claimed he invented it first. Margaret fought Charles Annan's claim. She traveled to Washington, D.C. to fight him in court. After days of presenting evidence, Margaret received credit for being the first person to develop the paper-folding device. She was awarded the patent for her invention in 1870.

Margaret spent her life developing new and useful inventions. Eventually, she held the rights to 27 patents. In fact, reporters referred to her as "Lady Edison" because of her many discoveries. Nevertheless, it was her first invention of the paper-bag machine that continues to make our lives simpler, even in today's modern world.

"Big Thinkers: Was Steve Jobs This Generation's Thomas Edison"

Tech

BIG THINKERS

Was Steve Jobs this generation's Thomas Edison?

When Steve Jobs, co-founder of Apple, died on October 5 at age 56, countless tributes cited his achievements. Many put his name alongside that of another great achiever. One obituary said of Jobs, "The 20th century's Thomas Edison has stepped from the stage." Is the comparison an apt one?

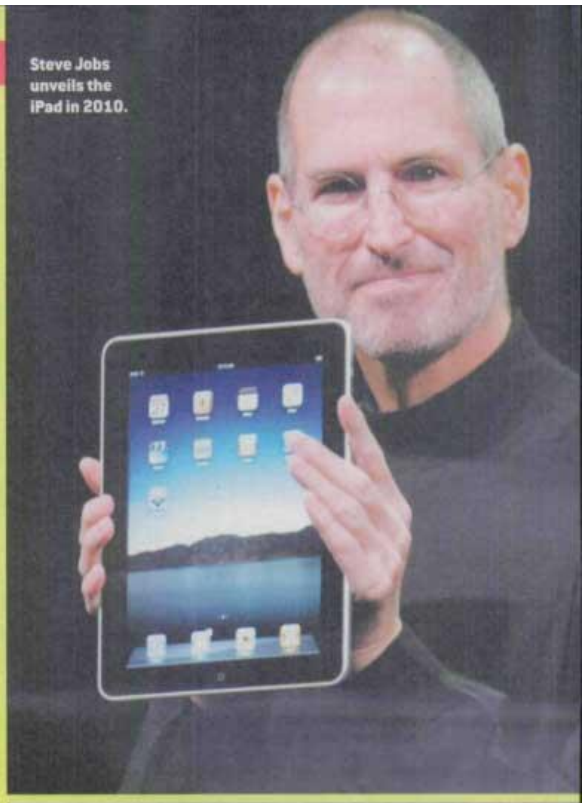
Thomas Alva Edison (1847-1931), the world's most famous inventor, created or improved devices that revolutionized the way people lived. His work brought electricity and electric-powered devices into people's homes and everyday lives for the first time.

Jobs is cited as the inventor or co-inventor on 313 U.S. patents. By contrast, Edison's name is on 1,093.

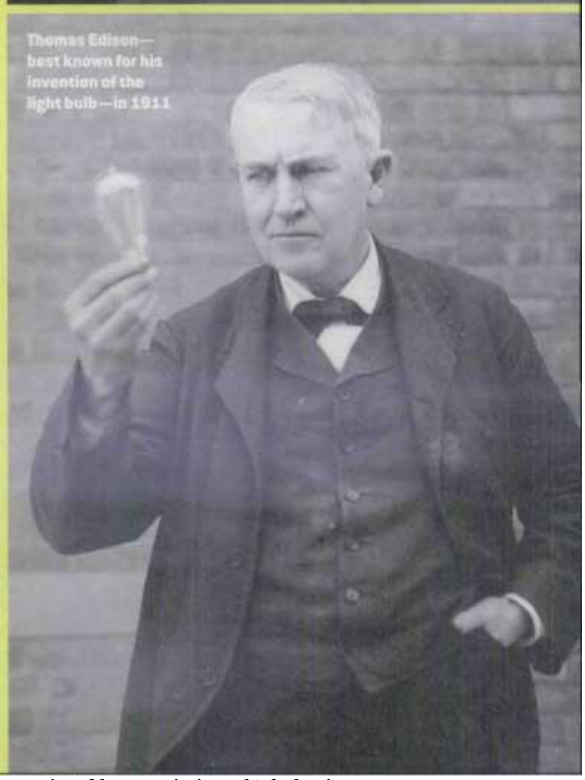
Though he may not be Edison's equal in terms of patents, Jobs is clearly one of the world's great innovators. Other people invented the computer mouse and the MP3 player; Jobs found ways to make such devices sleeker, more versatile, and easier to use.

Jobs founded Apple Computer in 1976 with a high school friend. "We worked hard," he told students at Stanford University in 2005, "and in 10 years Apple had grown from just the two of us in a garage into a $2 billion company with over 4,000 employees."

In 1984, Apple introduced the Macintosh. Macs were the first "user-friendly" computers. They let people do what we now take for granted: interact with computers with on-screen images and a mouse rather than by typing in long, tedious commands. Other popular Apple innovations include the iPhone, the first touch-screen cell phone; the iPad, the leading touch-screen tablet; and iTunes, a cheap—and legal—way to buy music online. "A lot of times," Jobs once said, "people don't know what they want until you show it to them."



Steve Jobs unveils the iPad in 2010.



Thomas Edison—best known for his invention of the light bulb—in 1911

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"Television" (excerpts)

Name:

Date:

Effects of television.
In many countries, television ranks as a major influence on life. It affects the way people spend their time and what and how they learn.

Effects on leisure time.
Throughout the industrialized world, watching television is one of the most time-consuming leisure activities among adults. Some critics say that television viewing takes time away from other activities, such as reading, conversation, social gatherings, and exercise.

Effects on learning and perception.
Television can contribute greatly to what viewers learn. It may benefit people by widening their experience. On the other hand, TV also may contribute to harmful impressions of the world.

Enriched experience.
No communication system has ever provided so many people with as wide a range of new experiences as television has. Without leaving their homes, TV viewers can watch government officials perform important functions. They can see how people in far-off lands look and live. Television takes viewers to deserts, jungles, and the ocean floor. A TV viewer can see how a famous actor performs the role of Hamlet, and how top comedians draw laughter. Television gives its viewers a glimpse of real-life tragedy, such as when it covers the victims of war, natural disasters, and poverty. It also captures moments of great triumph, such as when astronauts first set foot on the moon.

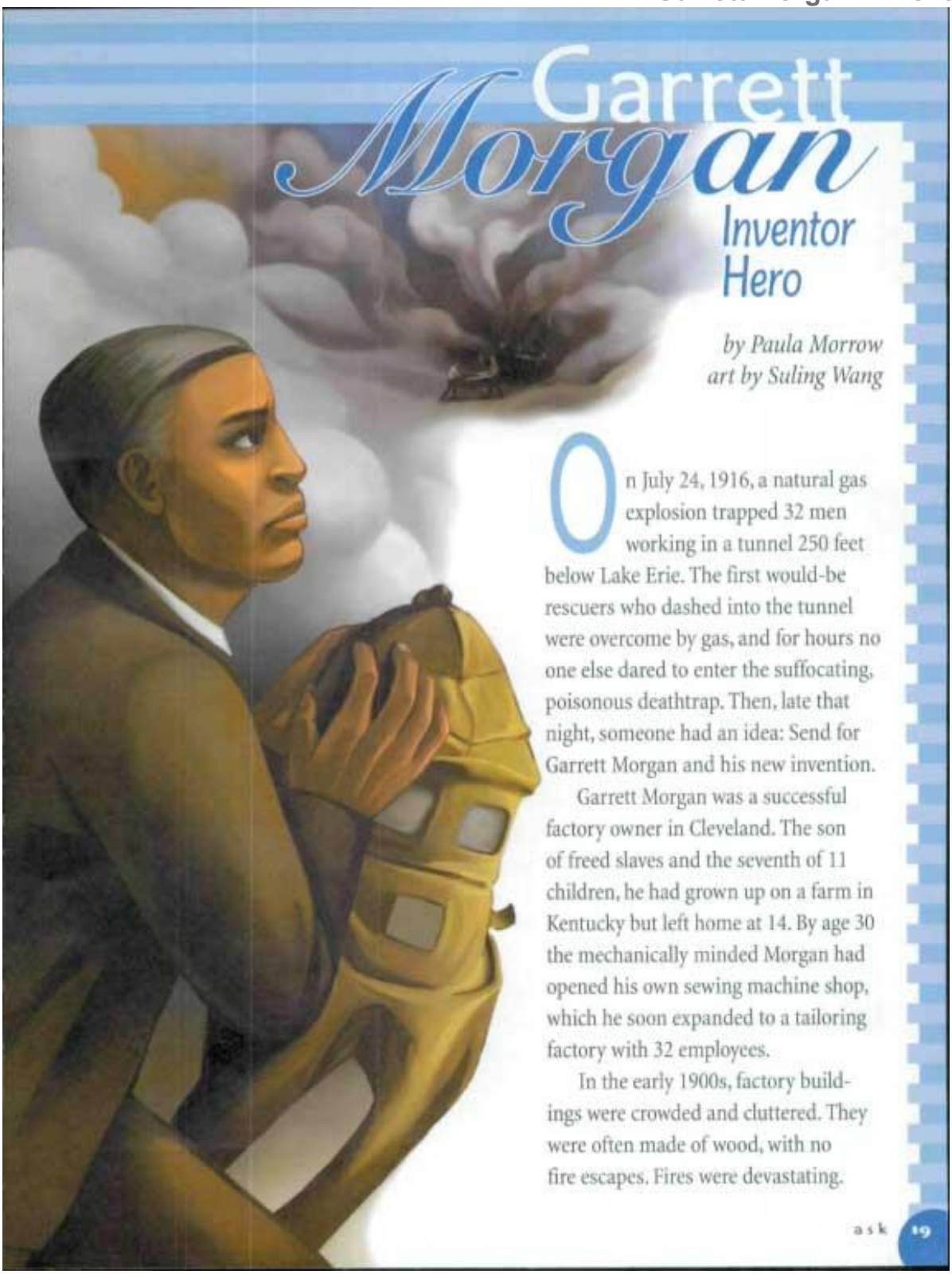
"Television" (excerpts)

Harmful impressions.
Many social scientists believe that people will likely form false impressions from watching a great deal of television. One of these impressions is that many people are better off than they are. Another is that the world is an unfriendly place, filled with untrustworthy people and risky circumstances.

Television programs often show people leading more glamorous lives and owning more material goods than most viewers. In addition, TV commercials constantly urge viewers to buy things. Many sociologists believe that as a result, the material expectations of TV viewers are raised, sometimes to an unrealistic level.

Some social scientists claim that television violence encourages some viewers to believe the world is a more violent place than it actually is. As a result, some people may become overly suspicious and fearful of others. But other scholars point out that storytelling throughout history has often featured tales of struggle, violence, and revenge.

World Book Online InfoFinder. World Book, 2014. Web. 6 Feb. 2014.



Garrett Morgan Inventor Hero

by Paula Morrow
art by Suling Wang

On July 24, 1916, a natural gas explosion trapped 32 men working in a tunnel 250 feet below Lake Erie. The first would-be rescuers who dashed into the tunnel were overcome by gas, and for hours no one else dared to enter the suffocating, poisonous deathtrap. Then, late that night, someone had an idea: Send for Garrett Morgan and his new invention.

Garrett Morgan was a successful factory owner in Cleveland. The son of freed slaves and the seventh of 11 children, he had grown up on a farm in Kentucky but left home at 14. By age 30 the mechanically minded Morgan had opened his own sewing machine shop, which he soon expanded to a tailoring factory with 32 employees.

In the early 1900s, factory buildings were crowded and cluttered. They were often made of wood, with no fire escapes. Fires were devastating.

ask 19

Garrett Morgan: Inventor Hero

Morgan's safety hood (shown below) was the model for the gas mask used by the U.S. Army during World War I. The gas mask saved countless lives.

Concerned about his employees, Morgan experimented with a "safety hood" that would allow the wearer to breathe despite a fire's toxic smoke. Morgan knew smoke rises during a fire, so he created a heat-resistant hood with a long tube reaching to the floor. Wearing Morgan's hood, a firefighter could breathe the cleaner air near the ground. Morgan lined the breathing tube with a sponge-like material that was moistened before use to cool and filter the air. A second tube released exhaled air.

Roused from home on the night of the tunnel explosion, Garrett rushed to the disaster site with samples of his safety hood.

Anxious survivors of the tunnel disaster wait to see if Garrett Morgan's invention will save the trapped workers.

Still in their pajamas, he and his brother Frank put on hoods and bravely entered the tunnel. It was a dangerous test of the invention, but they saved two lives and recovered four bodies before officials closed the site. Morgan knew that more lives might have been saved if he had been called sooner.

The daring rescue made Morgan famous and brought requests for safety hoods from fire departments around the country. But his greatest reward was knowing that his invention would now save more people.

Over the years, Morgan patented many ideas that saved lives or made life easier. In those days, city streets were crowded with horses, carriages, bicycles, and pedestrians. One day, Morgan—the first African American in Cleveland to

buy an automobile—was driving his new car when he witnessed a terrible collision between another car and a horse-drawn carriage. Morgan decided that traffic-control signals could prevent such tragedies.

Other inventors had experimented with this idea, but their mechanical signals had to be operated by hand and were not visible at night. In addition, existing signals had no caution sign between stop and go, so a driver going one direction might start across an intersection before an oncoming driver had time to stop. To solve these problems, Morgan invented an electric traffic signal with three positions: stop, go, and an all-directional stop for vehicles to let pedestrians cross in safety. His signals could operate 24 hours a day, with a spotlight for nighttime use. After patenting his design, Morgan sold the rights to General Electric Corporation for $40,000. His signals were used across the country and set the standard for the red-yellow-green traffic lights we use today.

Once in a while, someone comes along who actively looks for ways to keep others safe. Such a person was Garrett Morgan who, in addition to his inventive genius, was blessed with genuine concern for the well-being of other people.

The patent drawing for Garrett Morgan's three-position traffic light.

A good old-fashioned traffic jam—before Garrett Morgan's invention.

Airplane

The airplane has had a greater impact on our lives than any other modern invention. The ability to fly has dramatically increased the speed at which we can travel and decreased the time it takes to receive mail, food, and other goods from far-off places. It has brought us into closer contact with people in other parts of the world, and it has drastically changed the way we wage war.

Yet, until the beginning of the 20th century, the idea of a practical flying machine was only a dream. Balloons and gliders had been flown before 1900, but they were unreliable and could not carry a person over a long distance and land at a chosen destination. It was not until Orville and Wilbur Wright invented and successfully flew the first powered, controllable aircraft that the dream of flight became a reality. On December 17, 1903, the Wrights' plane, the *Flyer*, took off at Kitty Hawk, North Carolina, and flew 120 feet (37 meters).

Airplane Design

An airplane can fly at fast or slow speeds over long or short distances. It can carry hundreds of vacationers around the world or a single person from one side of a major city to the other. The designer of an airplane must keep in mind the task the airplane is to accomplish. Will the airplane fly great distances? If so, the designer will have to provide either very efficient power or the capacity to store a great amount of fuel. Should the airplane's structure be relatively light or heavy? That depends on the cargo it will carry. This might be two persons or a whole company of soldiers and equipment. A large airplane will mean more weight and more drag. As a result, larger engines and wings will be necessary to get it airborne. Crop dusters, aerobatic biplanes, personal transportation aircraft, and airliners all have different design requirements. The airplane designer has many choices to make, and modern technology can help with these decisions.

The New Book of Knowledge. Grolier Online, 2013. Web. 16 Sept. 2013

It's Not Just a Game!

By Lori Calabrese

Whether you run a race, bounce a basketball, or hurl a baseball home, you do it because it's fun. Some scientists claim play is a natural instinct—just like sleep. That might explain why sports are likely to be as old as humanity.

Some claim sports began as a form of survival. Prehistoric man ran, jumped, and climbed for his life. Hunters separated themselves by skill, and competition flourished. Wall paintings dating from 1850 B.C., that depict wrestling, dancing, and acrobatics, were discovered in an Egyptian tomb at Bani Hasan. The Ancient Greeks revolutionized sports by holding the world's first Olympic games at Olympia in 776 B.C. But it wasn't until the early nineteenth century, that sports as we know them came into play. (Pardon the pun!) Modern sports such as cricket, golf, and horse racing began in England and spread to the United States, Western Europe, and the rest of the world. These sports were the models for the games we play today, including baseball and football.

All organized sports, from swimming to ice hockey, are considered serious play. There are rules to obey, skills and positions to learn, and strategies to carry out. But Peter Smith, a psychology professor at Goldsmiths, University of London, and author of Understanding Children's Worlds: Children and Play (Wiley, 2009), says, "Sport-like play is usually enjoyable, and done for its own sake."

Different Sports for Different Folks

Sports come in many shapes and sizes. Both team and individual sports have advantages and disadvantages, but most people find that from an early age, they are drawn toward one or the other. In a team sport like soccer, you're part of a group, striving to be a winning team. That means putting the team ahead of your own accomplishments. You must learn to get along with your teammates and share responsibility. In an individual sport like tennis, you're usually only concerned about your own performance. That can make these sports more challenging.

The Ultimate Value of Sports

Whether it's football or golf, there's little doubt about the value of sports. According to the American Academy of Pediatrics (AAP), "play is essential to the cognitive, physical, social, and emotional well-being of children and youth." Play not only exercises our bodies, it also exercises our minds. Sports teach us about ourselves and our world. We learn how to negotiate plans, settle disagreements, and how to monitor our attitude. The skills we learn playing can be applied to school and work. Since organized sports are a hands-on, minds-on learning process, they stimulate our imagination, curiosity, and creativity. The growing science of play is armed with research claims that play, and thus sports, is important to healthy brain development. We use language during play to solve problems, we use thinking when we follow directions to a game, and we use math skills to recognize averages and odds of each sports play.

Sports also raise our energy level and act as antidepressants. Activity increases the brain's level of chemicals called endorphins, which boost mood. When we start moving and having fun, we feel good about ourselves.

Forgetting the Fun

In a perfect world, everyone would have fun playing sports. But that's not always the case. Sports can get aggressive and cause scrapes, bruises, and broken bones. They can also hurt us psychologically. David Elkind, professor emeritus of Child Development at Tufts University and author of *The Power of Play*, says that when young children play self-initiated games such as tag or hide and seek, "misunderstandings and hurt feelings are part of the learning process, and happen in a context of mutual respect. Those that arise in organized team sports, don't have the same supportive network, the sense of competition outweighs the sense of cooperation, and can be hurtful to the child's sense of self and self-esteem." Playing sports is usually fun, but sometimes we can get frustrated. It might be because of the pressure to win, parents who yell and scream from the stands, or coaches who treat us unfairly. Sports are supposed to bring people together, but they can also drive people apart. When sports are separated into skill level, gender, or ethnicity, some players feel isolated, begin to forget the fun in sports, and even want to quit. Sports may not always be a positive experience, but even when they're not, they give us a dose of how to face life's challenges.

Making Sports Work for Us

Playing sports doesn't mean you have to play on a varsity team. And very few people have what it takes to be a professional athlete. But your school basketball coach or gymnastics teacher has found a way to make play their work. And in doing so, they've found the work best suited to who they are. According to Elkind, "Whenever we combine play with work, as in our hobbies, cooking, gardening, sewing, and carpentry, it is the full utilization and integration of all our interests, talents, and abilities. It's an activity that makes us feel whole."

Play is so important to our development that the United Nations High Commission for Human Rights has included it as a right of every child. In other words, it's your birthright to play! And there's no better place to play and learn about the world than on a sports field. So regardless of your sport—from swimming to soccer—play to have fun and you'll automatically win!

Keep Your Eye on the Ball

Are your eyes glued to the TV when LeBron James takes the court or Derek Jeter steps to the plate? While fans fill arenas, even more click their TVs on at home to watch athletes slam a puck into a net or hit a ball with a fat stick. Play is not only something to do, it's something to watch others do.

It's Not Just a Game!

Sports are a form of entertainment. The joy you and your teammates get by working together is the same joy your family, friends, and other spectators get when they watch. Fans experience the thrill of victory and the agony of defeat, just like the players on the field. Think of all the applauding, shouting, and yelling that happen at sporting events. It's a way for many of us to live vicariously through the players' actions.

Sports are also social events, opportunities for strangers to cheer together and debate outcomes. A Saturday morning game is a great way to spend time with family.

Sports involve learning, too. Fans research players, teams, and the sports themselves. How many fans do you know who are walking encyclopedias of sports trivia?

Why do so many of us watch sports and have a favorite team? Studies show that it fills both emotional and psychological needs. We feel self-confident and experience joy when our favorite team wins. Sports fulfill our human need to belong, and many fans, whether their team wins or loses, enjoy the suspense that allows them to release their emotions. Where we live, our family background, peer pressure, and our own sense of self (identity) all determine which baseball cap we wear and why we root for our team.

So the next time you put your Red Sox cap on and tune in to the game, remember it's not just about the amazing pitchers and batters, but about the way you feel when you watch your team play.

Baseball—From the 1830s to the late 1850s, Americans played a variety of ball and bat games. The first recorded baseball game took place in 1846 in Hoboken, New Jersey.

Football—Derived from rugby, a game played at public schools in England, football began to develop in Canada and the United States in the mid-1800s. The first game of American intercollegiate football, most resembling today's game, was played between Tufts University and Harvard on June 4, 1875, at Jarvis Field in Cambridge, Massachusetts. Tufts won, 1–0.

Basketball—In 1891, physical education instructor Dr. James Naismith invented the game of basketball in Springfield, Massachusetts. Designed as a sport to be played indoors during cold New England winters, basketball was originally played with a soccer ball and two peach baskets. In 1901, open-ended hoops replaced the game's closed baskets and basketball's "thirteen original rules" were created.

Lori Calabrese, "It's Not Just a Game!" in Odyssey (Jul/Aug 2009, 18:6, 36).

Roots of American Sports

The Olympics provide many sporting events in which several dozen countries compete. The original Olympics date back to 776 B.C.E. to 393 C.E. Present day **sports** like golf and soccer were later introduced to America.

Golf dates back to the 16th century, originating in Scotland. During the 1800's, **sports** became more popular in America with the arrival of baseball and the introduction of football by England, which America calls soccer.

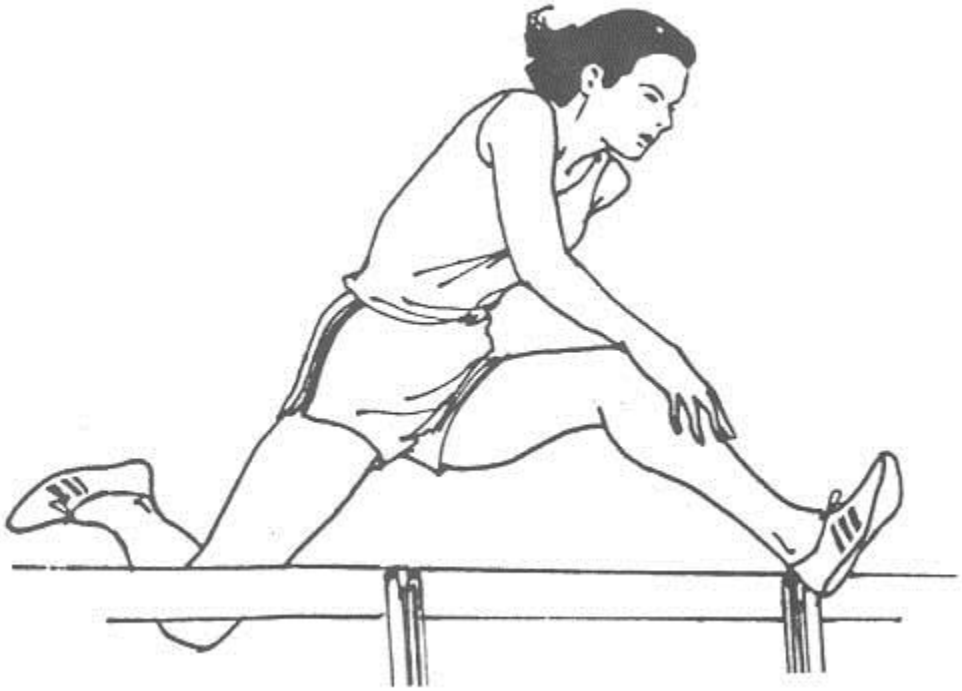
Over the past two hundred or so years, **sports** have become a part of **American** culture. There are several influences on **American sports**. Some of those influences were brought over from the Europeans after colonization, and some have been more recent due to an increase in immigration.

During the 20th century, professional **sports** became popular with many athletes playing in college then going on to play for a professional team. Professional **sports** are a form of entertainment for many people around the world with many going to games or watching them on television. The professional **sports** bring in a large amount of money by selling game tickets, advertising, and merchandising.

Sporting events provide a sense of community for many **American**. More time has been made for leisure activities like **sports** due to a decrease in work hours. **American** share the same sporting events with other countries such as soccer, gymnastics, and swimming.

The Olympics provide many sporting events in which several dozen countries compete.

Roots of American Sports



Sporting events provide a sense of community for many **Americans**.

Phyllis Goldman, "Roots of American Sports," in Ally's Multicultural History & How It Relates to Us Today (Greensboro, NC: Allosaurus Publishers, 2005), p 92.
www.allosauruspublishers.com

Earth's crust remains in constant motion. Slowly but powerfully, its pieces rub against each other and collide. These collisions produce earthquakes. So does the movement of melted rock pushing up to Earth's surface.

Thousands of earthquakes occur on our planet each year. The largest cause deadly damage. They crumple buildings and bridges. They set off massive landslides. Some also spark devastating waves called tsunamis.

Throughout history, people have known the terror of great earthquakes. In Japan, legend blamed them on the movement of a giant underground catfish. The ancient Chinese thought that they were caused by a huge tortoise. About 2,300 years ago the Greek philosopher Aristotle said that underground winds shook Earth.

Causes of Earthquakes

Seismologists, scientists who study the motion of Earth, now know that quakes stem from forces deep inside our planet. There, heated rocky material is flexible. It moves slowly and steadily. Near Earth's surface the rocky material cools. The crust of Earth is formed of plates made of this material. Plate tectonics is the study of how these giant fragments move. These plates are brittle and cannot move easily. The slow movement of material deep in the interior builds up. It pushes on the brittle rocks near the surface.

Earth's plates move only a few inches every year. No one feels this movement except where the plates rub together or stretch apart. The slow movements create large pressures. This causes huge areas of rock to break and slip. During this violent fracture, some rock dives into Earth's interior. Other rock thrusts upward. This results in an earthquake. Often a break in Earth's surface occurs at a fault. A fault is a break where two blocks of rock have moved past each other previously.

Seismic Waves

The movement of Earth releases a huge amount of energy. Some of it takes the form of shock waves called seismic waves. These shocks radiate out from the center of the quake. They can cause violent shaking. There are two main types of seismic waves: surface waves and body waves.

Surface waves travel along the surface of the ground. In large earthquakes, they can cause people to feel a swaying or rolling motion.

Body waves move deep underground. They are faster than surface waves. Compression waves are the fastest type of body wave. They are also known as P waves. Shear waves, or S waves, are the slower type of body wave.

Measuring Earthquakes

Scientists use seismometers to measure the distance the ground moves during an earthquake. This tells them how large the seismic waves are. There are thousands of seismometers in use all over the world.

Seismometers create records called seismograms. When an earthquake strikes, scientists read the seismograms to learn about the earthquake. These records show how powerful an earthquake is. By looking at several seismograms, scientists can also figure out the source of the earthquake. This source is called the epicenter. Directly below it is the hypocenter, the place where the rock actually breaks, causing an earthquake.

Size and Strength of an Earthquake

Earthquakes are measured in intensity, magnitude, and seismic moment. Intensity is how strong the shaking of an earthquake is. It is measured on the Modified Mercalli Intensity Scale. The scale uses 12 roman numerals. An intensity of I is the weakest; XII is the strongest. Measurements taken after an earthquake are used to create intensity maps.

The best-known gauge of earthquake magnitude is the Richter scale. It was invented by Charles Richter (1900–85) in 1935. The Richter scale starts at 0. Each whole-number increase represents a tenfold increase in earthquake size. That means that a 3.0 earthquake would be 10 times more powerful than one that measures 2.0. Today, scientists use many other scales in addition to the Richter scale.

Seismic moment measures the physical conditions at the earthquake source. The seismic moment is determined using three factors. The first is the fault slip. This is how far the rock slides along a fault surface after it breaks. The second factor is the area of the fault surface that is actually broken by the earthquake. And the third factor is the measurement of how rigid the rocks are near the broken fault. The seismic moment is found by multiplying these three numbers. It tells scientists an important combination of information about an earthquake's source.

How Often Do Earthquakes Occur?

Earthquakes occur thousands of times each year. But most pass unnoticed. Small earthquakes happen much more often than large ones. For each increase of one magnitude, there are about 10 times fewer earthquakes. Every year, about 10,000 earthquakes of magnitude 4 or greater strike. But there are only about 1,000 earthquakes of magnitude 5 or greater.

Predicting Earthquakes

Accurate and timely earthquake predictions could save thousands of lives each year. Unfortunately, precise predictions remain difficult to impossible. Still, many experts are learning how changes in Earth's crust may provide warnings. These warning signs include underground movements and changes in water levels.

By studying such precursors and other predictors, scientists hope to help communities prepare for quakes. For instance, engineers have learned how to build quake-resistant buildings and bridges. Their designs improve every year with stronger and more flexible designs.

We may never be able to control earthquakes. But we can learn to live with them.

"Earthquake." The New Book of Knowledge. Grolier Online, 2013. Web. 15 Oct. 2013.

"A Rocky Road Ahead"

news zone

A Rocky Road Ahead

Haiti, one of the U.S.'s nearest neighbors, struggles after quake

The January 12 earthquake left Haiti's Presidential Palace in ruins.

People in the nation of Haiti are struggling to recover weeks after a devastating earthquake. The powerful 7.0-magnitude quake caused massive destruction in the Caribbean nation (*see map*).

Tens of thousands of people were killed, and many more were hurt. The Presidential Palace, which is like the White House here in the U.S., was among the many government buildings that collapsed. Countless homes were destroyed, along with schools and hospitals. The disaster added to the suffering of a people already struggling to cope with everyday life. Haiti is one of the poorest nations in the world.

A boy sits amid the rubble of a school.

Aid groups from the U.S. and around the world rushed to provide food, water, and medical supplies to Haiti. People worldwide are donating money. The U.S. has sent money and troops to help with relief efforts, and to police the streets. "This is a time when we are reminded of the common humanity that we all share," President Barack Obama said. "With just a few hundred miles of ocean between us . . . Haitians are neighbors . . . .we have to be there for them in their hour of need."

The earthquake's **epicenter** was about 10 miles from Haiti's capital, Port-au-Prince. Experts say it was the worst earthquake in the region in more than 200 years.

Americans have pitched in. They have donated money and collected food and clothes. Some have traveled to Haiti to volunteer their medical or search-and-rescue services. Many Haitian-Americans are especially concerned—they have loved ones there. More than 700,000 Americans are of Haitian descent.

"I'm thinking about if my sister's all right," Kathleen Saint Armand, 10, of Brooklyn, told the *Daily News* of New York. ■

Word to Know

epicenter (EP-uh-sent-ur) *noun.* The area directly above the place where an earthquake occurs.

FAST FACTS:

HISTORY: A slave uprising led to Haiti's gaining its independence from France in 1804.

LOCATION: Shares the Caribbean island of Hispaniola with the Dominican Republic

SIZE: Slightly smaller than the state of Maryland

MAJOR LANGUAGES: French and Creole

POPULATION: 9 million; 38 percent are kids under 15.

ECONOMY: Haiti is the poorest nation in the Western Hemisphere. Most people live on less than $2 a day.

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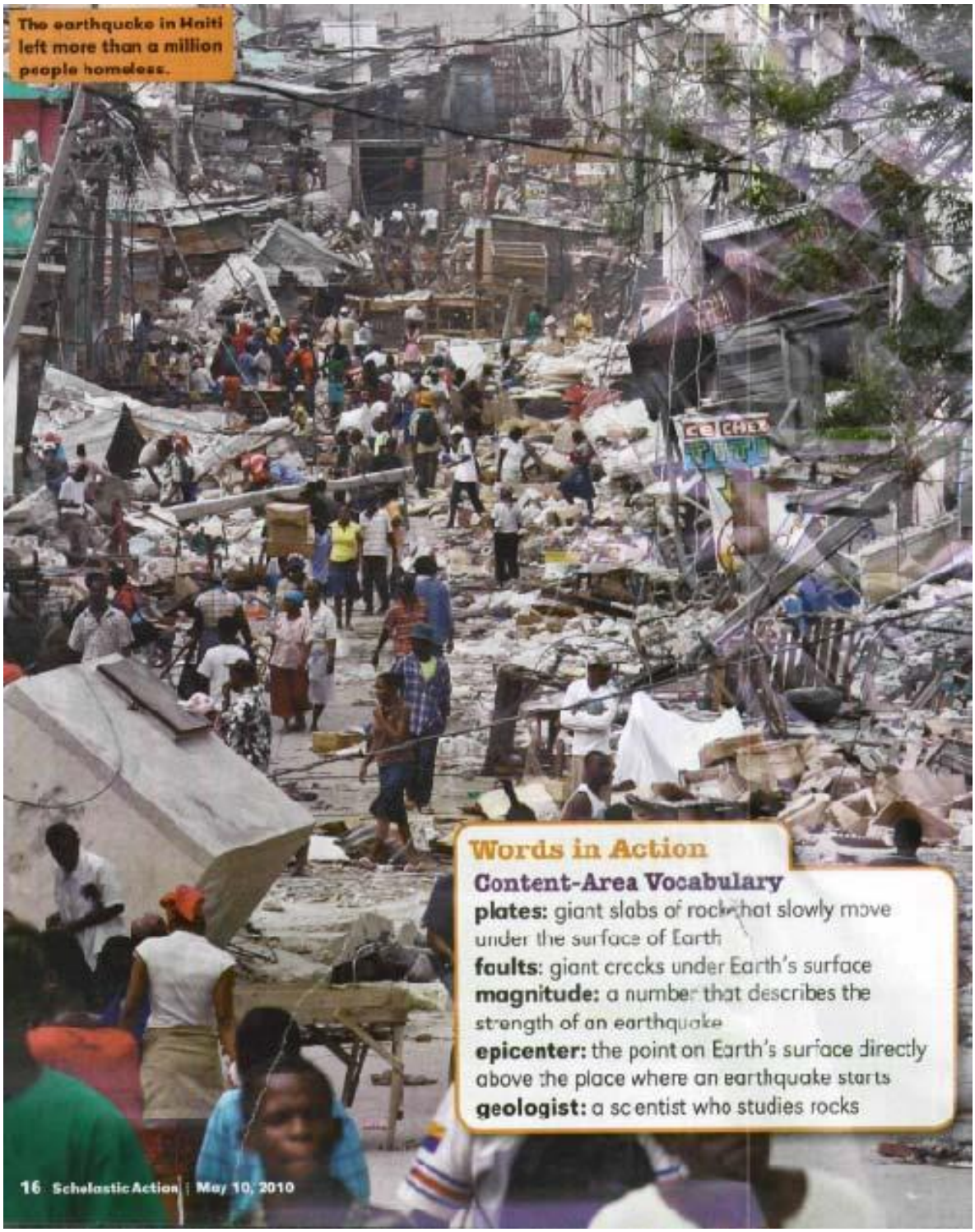
"On Shaky Ground"
By Britt Norlander



"On Shaky Ground"
By Britt Norlander

On Shaky Ground

Powerful earthquakes struck Haiti and Chile this year. Find out what caused them, and how teens are helping survivors.

Darlene Etienne was 16 years old when she almost died. She was at her cousin's house in Haiti when a powerful earthquake struck. The house crashed down around her.

Darlene was trapped. Fifteen days passed before neighbors heard her calling. A rescue team dug her out.

Darlene was lucky to survive. More than 220,000 people died in the earthquake that struck Haiti in January.

Less than two months later, another earthquake shook the ground in Chile. The quake was more powerful than the one in Haiti. But fewer than 1,000 people died.

The two earthquakes were very different. But they both started the same way.

Moving Rocks

Underneath the Earth's surface are rock **plates**. These giant slabs of rock are always slowly moving. The shifting rocks meet along the edges of the plates. Where they meet, there are underground cracks called **faults**. Both Haiti and Chile are located near faults.

The rocks don't move smoothly along a fault. They rub against each other and get stuck. Over time, pressure builds up along the stuck parts of the fault.

When the pressure becomes too high, the rocks snap. The sudden breaking apart shakes the ground, causing an earthquake.

Built to Last

Scientists measure the strength of an earthquake based on how much shaking occurs. The earthquake in Haiti had a **magnitude** of 7.0. The earthquake in Chile had a magnitude of 8.8. Even though the quake in Chile was stronger, it caused less

Rescue workers pulled Darlene Etienne from the rubble.

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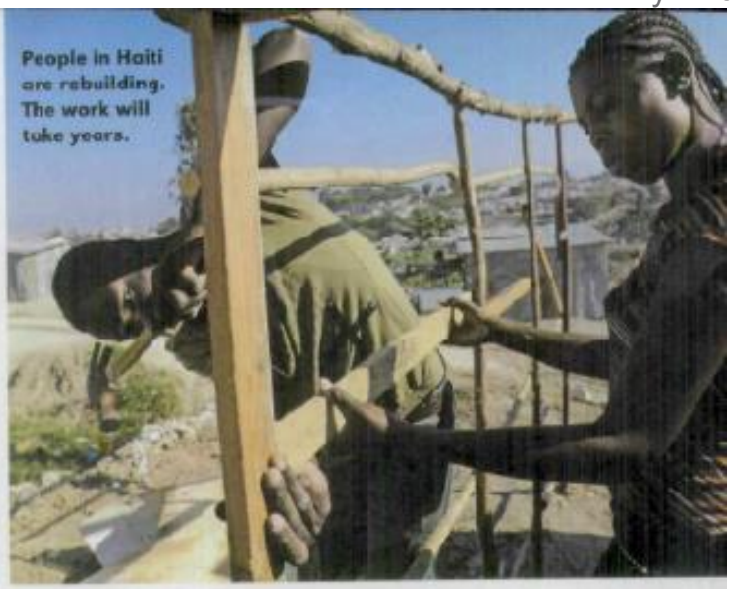
"On Shaky Ground"
By Britt Norlander



People in Haiti are rebuilding. The work will take years.

damage than the one in Haiti.

One reason for the difference in damage is that the buildings in Chile are stronger. Quakes hit Chile often. Buildings there are made to stand up to shaking. There hadn't been an earthquake in Haiti in more than 200 years. Buildings there weren't as strong.

Danger Zone

The Haiti earthquake also caused more damage because of its location. An earthquake's **epicenter** is the point on Earth's surface directly above the spot where the quake starts.

"Usually, the epicenter is where the shaking is the strongest," explains Michael Hamburger, a **geologist** at Indiana University.

The epicenter of the Chile earthquake was located away from places where many people live. In Haiti, the epicenter was only 10 miles from the capital city of Port-au-Prince. "The area of highest shaking was very close," says Hamburger. The violent shaking destroyed more than half of the city's buildings.

Helping Hands

People in Haiti and Chile are trying to clean up the ruins and help the victims. In Haiti, the quake left about 1.5 million people homeless. All those people need food and other supplies.

Teens at schools around the U.S. are working to help the victims. At Evans High School in Orlando, Florida, students have been gathering supplies to send to Haiti. "We have collected a lot of canned goods, water, and other items," says Rosemonde Emile, 17.

Many students in the school are originally from Haiti. Others, like Rosemonde, have family members who live there. "Everyone is coming together to help," says Rosemonde.

You can help too. Visit **www.scholastic.com/actionlink**. There, you'll find out how to support organizations that are helping earthquake victims.

—Britt Norlander

This house in Chile crumpled from the force of the quake.

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"On Shaky Ground"
By Britt Norlander

READING A MAP

Shaky Spots

Earthquakes shook Haiti and Chile this year. The greatest damage happened closest to the epicenter of each earthquake. Look at the maps to see where the epicenters were. Use the maps to answer the questions.

Earthquakes in Haiti and Chile

Date of earthquake: February 27, 2010

Date of earthqucke: January 12, 2010

1. Which country is closest to Haiti?
Ⓐ Cuba
Ⓑ Argentina
Ⓒ U.S.
Ⓓ Dominican Republic

2. What city was close to the epicenter of the earthquake in Haiti?
Ⓐ Concepción
Ⓑ Port-au-Prince
Ⓒ Bahamas
Ⓓ Santiago

3. The earthquake in Chile happened closest to which body of water?
Ⓐ Atlantic Ocean
Ⓑ Caribbean Sea
Ⓒ Pacific Ocean
Ⓓ Arctic Ocean

4. What city was just south of the epicenter of Chile's earthquake?
Ⓐ Concepción
Ⓑ Port-au-Prince
Ⓒ Bahamas
Ⓓ Santiago

Answers are in the Teacher's Edition.

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"Help for Haiti"

COVER STORY WR

Help for Haiti

The world brings aid to earthquake survivors.

This boy's town was destroyed by the earthquake.

People in Haiti need your help! On January 12, a powerful earthquake shook the country. The quake had such force that many homes and schools were destroyed. Even parts of the president's palace crumbled.

Haiti is in Latin America. It is about 700 miles southeast of Florida. About 200,000 people died in the earthquake. It also caused millions of dollars' worth of **damage**, or harm. Officials estimate that 2 million Haitians were left homeless.

Many of those people now live outdoors. Families sleep in tents in Port-au-Prince. That is the capital of Haiti. People there need **urgent**, or immediate, aid. "I can't continue sleeping outside with the children," says Rose-Marie Dedieu, a mother in Haiti.

The United States and other countries are helping Haitians. The United States has **pledged**, or promised, $100 million in aid for Haiti. Former U.S. Presidents George W. Bush and Bill Clinton are leading the efforts. Americans are giving food, supplies, and millions of dollars to Haiti. Even kids are getting in on the act. Many students have been holding fund-raisers at their schools to collect money.

Winnie Romeril flew to Haiti a few days after the earthquake. She is a volunteer with the American Red Cross. Romeril and other workers are giving the people in Haiti blankets, water, and other basic items.

She says they're making small changes every day. "And we're going to keep making things get better … until people are really back on their feet again," Romeril told *WR News*.

THINK ABOUT IT: Why might the United States want to help Haiti?

A member of the U.S. military carries an injured Haitian girl.

Spotlight on Haiti

Population About 9 million

Size 10,714 square miles (Haiti is about the same size as Massachusetts.)

Main languages French and Creole, a mix of languages

History Haiti is the second-oldest country in the Americas, after the United States. It won its independence from France in 1804.

"Surface Amplified Haiti Earthquake"

DISCOVERIES

Even this well-constructed hotel could not withstand the amplified shaking that occurred on the ridge in Port-au-Prince where it was built.

Surface Amplified Haiti Earthquake

earth

PORT-AU-PRINCE, Haiti—Strong earthquakes occur around the world every year. So why was the one that struck Haiti a year ago this month so destructive? First, a large city, Port-au-Prince, is located near the center of the quake. Second, most buildings in Port-au-Prince are poorly built, and many crumbled when the quake shook them. Third, the city lies on soft ground, which intensified the shaking.

Now a team of U.S. geologists has discovered a fourth factor: the *topography* of the region. Topography is the shape, height, and depth of land's surface. Physical features that make up the topography of an area include mountains, valleys, plains, and bodies of water.

Only one *seismometer* existed in Haiti when the earthquake struck. A seismometer is an instrument that detects and records vibrations and movements in the ground.

"When the earthquake happened, it went dancing around on its little feet. It did make a record, but it wasn't very useful," one of the scientists, Susan Hough, told *The New York Times*. Hough works for the U.S. Geological Survey.

After the quake, Hough installed more seismometers in the country. She placed two on a prominent ridge in the city and two in an adjoining valley. Those four seismometers recorded the quake's *aftershocks*. Aftershocks are small tremors that occur hours, days, or weeks after an earthquake.

Hough found that the tremors were more severe along the ridge than they were in the valley. Those findings suggest that the shock waves produced by the original earthquake bounced back and forth within the ridge, amplifying the amount of shaking there, she says.

The ridge happened to be one of the few places in the city where the buildings were well constructed. Even those buildings could not withstand the quake's vibrations, intensified as they were by the ridge, says Hough. ■

awarded the prize last fall for their discovery of a wonder material called *graphene*. Both men are physicists at the University of Manchester.

Their discovery evolved from a "fun Friday afternoon project" several years ago, says Geim. The two men were doing a low-tech investigation of *graphite*'s ability to conduct electricity. Graphite is a mineral form of carbon. The lead in pencils is graphite.

To accomplish their goal, Geim and Novoselov had to shave off very thin flakes of graphite. They had no luck until a lab technician showed them how to strip off layers of graphite with the aid of transparent tape. The scientists refined their technique until they were able to peel off a layer of graphite just one atom thick. Graphene was born.

Geim and Novoselov first tested the superthin carbon's electric properties. *Electricity* is the flow of electrons through a conductor. In most conductors, the electrons flow in a haphazard way, bouncing around like pinballs. In graphene, the electrons sail through like bullets. That property opens up the use of graphene for a new generation of superfast electronics, the physicists say. Graphene could one day replace silicon as the standard material for semiconductors.

Thousands of scientists are now studying graphene. They've discovered that the material conducts heat better than any known material. It's also stretchy and superstrong. A hammock made of a single, superthin sheet of graphene could support a cat, yet it would weigh less than one of the cat's whiskers. ■

Left: The atoms in a layer of graphene are linked in a pattern like that of chicken wire. Right: Andre Geim, one of graphene's discoverers

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