Grade 7

English Language Arts Test
July 2015

Directions

207052P

Read this article. Then answer questions 1 through 7.

The Great Pumpkin

by Brendan Borrell

The Patch

Quinn Werner's backyard pumpkin patch overlooks a wooded creek. In the winter, when the maples and oaks stand like toothpicks and snow coats the western Pennsylvania valley, Werner gazes out his kitchen window and caresses his prizewinning seeds. The topsoil is frozen solid, and his orange tractor sits unused in the garage. He is not a big talker, but every Thursday his buddy Dave Stelts phones him, and their conversation always comes back to springtime—to the pumpkin patch and the weigh-off.

In April, Werner germinates his seeds, each one as long as a quarter, by soaking them in a mix of hydrogen peroxide and water. He pots them and incubates them in a cooler with heating pads.

He then places the seedlings under fluorescent lights upstairs in what he calls his pumpkin room. On nice days, he takes the little pots outside for an hour or two for fresh air and natural sunlight. In May, every seedling is planted in the patch under its own clear plastic tent fitted with incandescent bulbs that are switched on during chilly nights.

Within weeks, the vines stretch out from underneath the plastic like octopus arms. In June, when the first golden trumpets of female flowers begin to open, Werner pollinates them by brushing them with pollen-covered stamens from select male flowers. Then he covers them with plastic cups to prevent honeybees from meddling.

When I visited Werner's property on a sweltering summer afternoon, he was checking his patch for the third time that day. Werner straddled the orange mesh fence that surrounds his garden and waded through a sea of stiff, broad leaves toward a thigh-high dome covered by an old bedsheet.

His 12 pumpkins had been growing for less than a month, so I had expected that one would be small enough to hoist into the back seat of a car. Werner whipped off the sheet, and there sat a shiny pale pumpkin (they turn orange later in the year) that seemed to sag on one side like a mound of Silly Putty left out in the sun. Based on its circumference, he guessed it was pushing 400 pounds (180 kilograms). And the season had just begun.

Werner beamed. "It's real long and real wide," he said. "It's in really good shape."

But as he leaned in closer, running his hand along a smooth ridge, his face grew taut. "Oh, man, as a matter of fact, it's split."

Tucked into the blossom end of the pumpkin was a tiny crack. Even if the crack wasn't enough to disqualify the fruit from competition (and it was), it could widen and let in bacteria that would quickly rot the pumpkin from the inside. "That makes me sick," he said. "This is the reason why I grow so many."

Werner and his pal Dave Stelts are competitive gardeners who vie for bragging rights and prize money ranging from a few hundred to thousands of dollars. Their crop of choice is the Atlantic Giant Pumpkin, a freak of nature and intensive breeding. During peak growing season, these pumpkins can gain 50 pounds (23 kg) per day—which is sometimes too much. The cracked pumpkin Werner showed me had swollen too quickly after a hard rain.

In general he has kept about two-thirds of his colossal gourds intact. In 2008, he earned the title of "grower of the year" after trucking pumpkins to six weigh-offs and winning five. His pumpkins had an average weight of nearly 1,500 pounds (680 kg). "I lost by two pounds in the sixth," he says.

Since the 1980s, giant pumpkins have tripled in size, thanks to strategic breeding and hardcore growers with time on their hands and dirt under their fingernails. (From April to October, Werner spends six to eight hours per day tending his garden.) Thomas Andres, a squash expert who works at the New York Botanical Garden, has predicted that the first pumpkin weighing one ton (2,000 pounds, or 900 kg) will appear in 2014.

The Ohio Valley contest, Werner's local weigh-off, is one of the more than 80 competitions in the "Great Pumpkin Belt," an area that stretches across North America from Washington State to Nova Scotia. This is prime pumpkin territory. The region has 90 to 120 frost-free summer days, but is cold enough in winter to keep plant diseases and pests in check. The weigh-offs are friendly competitions, but they're also a form of at-home science. Growers meticulously graph their pumpkins' growth curves and share successes and failures—and seeds—with their peers.

"By God, if we can get a pumpkin up to a ton, imagine what we can do with somebody's vegetable crop," says Stelts, president of the Great Pumpkin Commonwealth. "What we are doing will be reflected on the dinner table of America."

At a pumpkin contest in Rhode Island, a pumpkin is transported for weighing.

14207033_1

1 Which idea is introduced in lines 1 through 6?

A Werner is focused on his hobby throughout the year.
B Werner believes that cooperation is the key to success.
C Werner's seeds are sought after by other growers.
D Werner's location has contributed to his success.

14207031_2

2 Read this sentence from lines 16 and 17.

Then he covers them with plastic cups to prevent honeybees from meddling.

The author uses the word "meddling" in line 17 to suggest that honeybees

A are sensitive to cooler temperatures
B will cause problems in the garden
C will leave the garden quickly
D are attracted to light sources

14207035_4

3 The photograph in the article is **most** closely related to

A lines 27 through 29
B lines 30 through 33
C lines 34 through 39
D lines 40 through 43

14207027_3

4 How do lines 44 through 48 reflect a central idea of the article?

A by explaining some of the challenges faced by pumpkin growers
B by explaining why pumpkin growers have the time to breed pumpkins
C by connecting the efforts of pumpkin growers to the size of giant pumpkins
D by showing the recognition that successful pumpkin growers get for their efforts

14207026_4

5 Which evidence from the article suggests that Werner's hobby is popular?

A Giant pumpkins have tripled in size since the 1980s.
B Competitions can earn gardeners thousands of dollars.
C Experts predict that a one-ton pumpkin will be grown soon.
D There are more than 80 competitions held in a particular area.

14207034_4

6 Lines 53 through 66 generate interest in the topic of great pumpkin growing by

A providing detailed descriptions of the weigh-offs
B describing challenges that growers must overcome
C mentioning that people can achieve similar results themselves
D suggesting that consumers can benefit from these friendly competitions

14207028_1

7 Which statement would be **most** important to include in a summary of the article?

A Growing giant pumpkins requires a combination of time and skill.
B Giant pumpkins grow best in regions that have changing seasons.
C Giant pumpkin weigh-offs generally take place in the spring.
D Growing giant pumpkins requires a background in science.

Directions

207059P

Read this story. Then answer questions 8 through 14.

Allegra Shapiro is twelve years old and lives in Portland, Oregon. She is waiting for her turn to compete in the Bloch Competition where she will be playing music by Wolfgang Amadeus Mozart (1756–1791), a famous classical composer. In order to play well and to focus both before and during her performance, Allegra pictures images in her mind. Often she imagines her beloved great-grandmother, Elter Bubbe Leah.

Excerpt from *The Mozart Season*

by Virginia Euwer Wolff

As I looked at the keyboard of the piano, my mind tried to empty itself; it tried to pour all my thoughts down a chute of some kind. I could feel them sliding away. Like a big balloon deflating, like a tank of something emptying. I felt my eyes bug out with the shock of it, and I saw my arms reach out to catch what was emptying out of me. I stood there looking at the space between my arms, and tried to find Mozart. I closed my eyes and looked for the first movement first; there it was, with its cadenza.[1] Second movement. Third. They were there, with their notes in order, with Mr. Kaplan's blue markings on the pages.

Very strange, my mind doing that. I picked up my violin and played the third-movement cadenza. It was there, solid, it hadn't gone off anywhere. I wrapped Elter Bubbe Leah's purse in its tissue paper and put it back in my violin case. I went down the hallway to the bathroom. I looked at myself in the mirror. I was just a person in a blue dress standing in dim light in a public bathroom next to a towel machine. I turned around and went back to room 104 and sat down with my violin and bow in my hand.

The envelope woman came and got me, and we walked down the hall and then down the stairs and then through a heavy door. Suddenly the lights were very bright and the floor was very polished and there was a line of screens on my right. Several screens were lined up so the jury couldn't see any part of me, even my feet. The woman pointed to where I was supposed to stand. I went to the spot and stood. It was the place Steve Landauer, Number Three, had just walked away from. I suddenly remembered Alice in Wonderland getting smaller and smaller. I propped myself firmly on my feet, looked down at them; they were the same size they'd been five minutes before, and I knew I wasn't shrinking.

I decided to look at the vertical line down one of the screens.

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[1] **cadenza:** a solo inserted into a movement (or section of music), typically near the end

A man's voice came from the other side of the screens: "Number Four, you may begin when you're ready."

I thumbed my strings and heard the D string a shade flat. While I was tuning it I closed my eyes and saw Elter Bubbe Leah's photograph with the purse and the goose and the broom, and into my vision came a teenage hand with a quill pen in it, just at the edge of the photograph. Music being written. I listened in my mind for the rhythm and I took a medium-size breath and started.

The start was a good one; notes came up out of the violin on time, in time, things weren't blurred, it was fun. Through the notes, I saw Elter Bubbe Leah shooing her geese up a slope with her broom in Poland; the notes went scooting along. It was strange: I was able to hear every note clearly, every group of sixteenth-notes, every little sforzando,[2] and at the same time I was seeing a movie of pastures and the little house in Suprasl.

The second movement. How many times Heavenly and I'd gone to sleep listening to it, with our arms around each other. I reached inside my body for the key change and the rhythm change and I felt for the gentleness of it. I saw Leah, a little girl in a long white nightgown, climbing into her bed by candlelight, and I took a medium-size breath and played. The notes sounded like little flickerings of flame from the candle, little bright lights floating in a dark room. I played it for her to drop off to sleep in her feather bed with her braids spread out on the pillow.

The third movement, the Rondeau.[3] If you turn on the radio just in time to hear this movement, you think it's such a happy thing, those alternating sections, dances. And yet, when you pay close attention, there's a kind of fragile sound—as if something's going to break somewhere but you don't know where. And little silences come up between the sections. I looked into what was going on in my mind and I saw the early morning waking Leah up with the sun coming in, a blessing. I took a medium-size breath and began. She woke up in the sunshine and she was a real girl in a real house, and I could see the grass and flowers growing as she walked outside, and I could feel the solid ground under her feet, and during the cadenza she was scampering along, very happy. And I got so carried away with the little girl in the story in my mind that I played an E-sharp a little bit askew, my finger came down on it too sideways. But I was happy. I was happy with the sounds of Mozart coming up out of the wood, and as I moved toward the ending it felt right. The last three notes came out just the way I liked them, balanced, even, each one of them getting softer until the last one just skips away into the air.

I took my violin down off my shoulder. I was in Portland, Oregon, and I'd just finished doing what I'd promised and feared to do. I was twelve years old, standing with my two feet on the floor and my arms hanging down. I might never even tell anybody

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[2] **sforzando:** a strong, sudden accent on a note or chord

[3] **Rondeau:** a medieval French song

about Leah and her goose and her feather bed in my mind. A whole story of her had happened inside the music. I looked down at the scroll[4] of my violin. It's like a seashell, as if there's such a story inside that you could never find out all of it.

A man's voice came from the other side of the screen. "Thank you, Number Four."

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[4] **scroll:** the wooden handle of a violin appears rolled up like a paper scroll

14207082_1

8 Lines 1 through 8 contribute to the reader's understanding of the story by

A allowing the reader to immediately understand Allegra's state of mind
B sharing with the reader the frustration Allegra feels before the performance
C emphasizing how important it is for Allegra to empty her mind of all thoughts
D suggesting that Allegra's surroundings are less important than her feelings

14207074_2

9 Why does Allegra think of Alice in Wonderland in lines 20 through 23?

A The size of the room makes her feel extremely small.
B She is so nervous that she feels as if she might be shrinking.
C She feels uncomfortable with the jury behind the line of screens.
D The boy before her makes her feel unsure because of his skillful playing.

14207073_1

10 Based on lines 27 through 31, which statement **best** explains how the photograph helps Allegra?

A It inspires a vision that prepares her for performing the music.
B It reminds her that her great-grandmother was a teenage musician like her.
C It provides a memory that creates a mood of disappointment.
D It prompts her to recall a pleasant time composing music with her great-grandmother.

14207080_2

11 In line 41, the narrator compares the musical notes to "flickerings of flame from the candle" to show that the sounds are

A strong and powerful
B gentle and delicate
C quick and changeable
D sad and brief

14207076_3

12 The author's repetition of Allegra taking "a medium-size breath" in lines 30 through 31, 40, and 49 helps to create a feeling of

A agitation before performing
B release in finally performing
C controlled focus during her performance
D patience in persisting through her performance

14207079_1

13 Read these sentences from lines 62 and 63.

> **I looked down at the scroll of my violin. It's like a seashell, as if there's such a story inside that you could never find out all of it.**

The simile suggests that Allegra

A appreciates her violin as full of possibility for the music she creates with it

B wishes she could unleash the secrets her violin hides from her

C relies on her violin for inspiration during performances

D respects her violin's beauty and craftsmanship

14207075_3

14 Which statement **best** expresses a theme of the story?

A Possessions can awaken pleasant memories.

B Focus and determination are essential for success.

C Imagination can inspire the emotion behind music.

D Family bonds require regular effort to remain strong.

Directions

207044P

Read this article. Then answer questions 43 through 49.

Telling Plastic to 'Bag It'

by Patricia Smith
with reporting by William Yardley of The New York Times

Two years ago, a dead gray whale washed ashore in Seattle's Puget Sound. When scientists examined the contents of the whale's stomach, they found more than 20 plastic bags.

"It was a gut-wrenching experience for me," says Robb Krehbiel, 23, of Seattle, "Nothing that we use for a few minutes should ever end up in the belly of a whale. That's just so wrong."

For the last seven months, Krehbiel has been working on a campaign to ban plastic grocery bags in Seattle. The ban passed in December and will go into effect July 1.

Seattle will join cities like San Francisco; San Jose, California; Portland, Oregon; Brownsville, Texas; and Westport, Connecticut, as well as the Outer Banks of North Carolina and several counties in Hawaii, that have already banned plastic grocery bags. And Washington, D.C., has begun charging a five-cent tax on plastic bags to discourage customers from using them.

Since 2009, 12 states have considered a variety of plastic-bag bans, according to The National Conference of State Legislatures. No statewide bans have passed. But the list of cities and counties with bag bans is growing.

Americans use between 70 billion and 100 billion plastic bags annually, with families taking home an average of 1,500 a year.

Paper Vs. Plastic

Environmental groups say plastic bags, which are made from petroleum products, increase America's dependence on oil and are a chief cause of litter. It takes about 12 million barrels of oil to make the plastic bags used in the U.S. annually. Most plastic bags eventually end up in landfills, where it can take hundreds of years for them to decompose. But first, or instead, many become litter.

"They're hanging from trees and littering our beaches," says Eric Goldstein of the National Resources Defense Council, an environmental group.

Plastic bags are also a major source of pollution in the ocean, where they can harm sea turtles and other ocean creatures that mistake the bags for food and eat them.

But Mark Daniels of Hilex Poly, a plastics maker based in South Carolina, calls the bans "badly misguided efforts."

He says 90 percent of Americans already reuse plastic grocery bags—as garbage bags, to pack school lunches, and to store household items.

"Moving consumers away from plastic bags only pushes people to less environmentally friendly options, such as paper bags, which require more energy to produce and transport, and reusable bags, which are not recyclable," Daniels says.

The plastic-bag manufacturing industry employs 10,000 Americans, and bans jeopardize those jobs, the industry says.

The U.S. is not the only place where bans have been instituted. Plastic bags are now banned in several nations including China, Italy, France, Bangladesh, Brazil, and Rwanda. Other countries tax plastic bags to discourage their use. In Ireland, for example, a 15-cent-per-bag tax introduced in 2002 has reduced their use by more than 90 percent.

Plastic Bottle Bans

Environmentalists in recent years have also targeted disposable plastic bottles for many of the same reasons they've set their sights on bags. The town of Concord, Massachusetts; several national parks, including the Grand Canyon; and a growing list of universities now ban the sale of disposable water bottles. A handful of big cities, like San Francisco and Seattle, ban the sale of plastic water bottles in government offices.

The plastic-bag bans already in effect have had a dramatic effect on litter, some officials say. In Brownsville, Texas, a plastic-bag ban in place for more than a year has eliminated more than 350,000 bags per day, according to former Mayor Pat Ahumada. He says the ban "transformed our city from littered and dirty to a much cleaner city."

Under the Seattle ban, plastic bags will still be available for produce and bulk grocery items. The new law also imposes a five-cent fee on paper bags.

Three years ago, Seattle city officials approved a 20-cent-per-bag fee on paper and plastic bags. The idea was to create a financial incentive to reduce pollution; the fee was supposed to prompt people to bring reusable bags with them to shop.

But before the 2008 fee could take effect, the plastic-bag industry led a petition drive that forced the issue onto a citywide ballot. In August 2009, in the midst of the recession and after the industry spent $1.4 million on the campaign, Seattle voters rejected the fee. It's not yet clear if the plastic bag industry will mount a similar campaign this time.

If there's a fight, Krehbiel, the Seattle activist, will be one of those arguing to keep the ban.

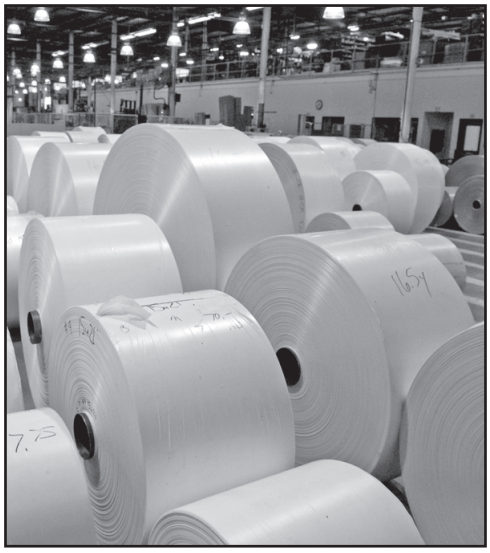
"It's not going to be a silver bullet that solves all our environmental problems," he says. "But my thinking is you do what you can, when you can, where you can."

Plastic Bags: By the Numbers

1,500
Average number of plastic shopping bags American families take home annually.

12 million
Barrels of oil it takes each year to make the plastic bags used in the U.S.

10,000
Number of U.S. jobs in the plastic-bag manufacturing industry.



132070077_2

43 The Seattle activist's use of the phrase "gut-wrenching" in line 4 suggests that learning about the plastic bags in the whale's belly was

A physically demanding
B emotionally painful
C very informative
D extremely tense

132070080_4

44 Why does the author include the information about plastic bottles in lines 41 through 45?

A to show where the idea for the plastic-bag ban originated
B to illustrate the conflict between environmentalists and businesses
C to show how the government is concerned with litter in public places
D to illustrate a widespread concern with plastic waste in the environment

132070075_2

45 In lines 52 through 58 of the article, the author explains events surrounding a citywide vote. Based on this information, readers can infer that

A Seattle voters were familiar with high fees

B economic concerns overrode concern for the environment

C Seattle city officials knew what the people really wanted

D leaders in the plastics industry were helpful in explaining a complex issue

132070073_1

46 Which evidence from the article suggests that plastic-bag bans are effective?

A A city in Texas has eliminated thousands of bags per day.

B Officials in Seattle have passed a ban on bags.

C Many cities now ban the use of plastic bags.

D Many people reuse their plastic bags.

132070081_2

47 The author of the article balances different points of view on the issue of banning plastic bags by including

A information about plastic-bag bans in Europe and Asia

B arguments from environmentalists and businesses on plastic-bag bans

C data from scientists concerned with plastic bags in the environment

D quotes from people living in American cities where plastic bags are banned

132070084_3

48 Which statement is supported by sufficient evidence from the article?

A The petroleum industry is fighting plastic-bottle bans.

B A statewide ban on plastic bags is unlikely to happen.

C Paying a fee on plastic bags is unappealing to some people.

D Many Americans prefer paper or reusable bags to plastic bags.

132070083_3

49 The author **most likely** includes "Plastic Bags: By the Numbers" at the end of the article to

A introduce new facts about plastic bags into the argument

B compare figures about plastic-bag use across the country

C emphasize the figures about plastic bags mentioned in the article

D show that plastic-bag bans can cause factory closures and large-scale job loss

Directions

307044P

Read this story. Then answer questions 54 and 55.

In this adventure story set in 1751, the narrator, David Balfour, has survived a shipwreck and finds himself stranded on a small islet. In this excerpt, he makes several attempts to cross a body of water to reach the main island, which appears to be deserted.

Excerpt from *Kidnapped*

by Robert Louis Stevenson

As soon as the day began to break I put on my shoes and climbed a hill—the ruggedest scramble I ever undertook—falling, the whole way, between big blocks of granite, or leaping from one to another. When I got to the top the dawn was come. There was no sign of the brig, which must have lifted from the reef and sunk. The boat, too, was nowhere to be seen. There was never a sail upon the ocean; and in what I could see of the land was neither house nor man.

I was afraid to think what had befallen my shipmates, and afraid to look longer at so empty a scene. What with my wet clothes and weariness, and my belly that now began to ache with hunger, I had enough to trouble me without that. So I set off eastward along the south coast, hoping to find a house where I might warm myself, and perhaps get news of those I had lost. And at the worst, I considered the sun would soon rise and dry my clothes.

After a little, my way was stopped by a creek or inlet of the sea, which seemed to run pretty deep into the land; and as I had no means to get across, I must needs change my direction to go about the end of it. It was still the roughest kind of walking; indeed the whole, not only of Earraid, but of the neighbouring part of Mull (which they call the Ross) is nothing but a jumble of granite rocks with heather in among. At first the creek kept narrowing as I had looked to see; but presently to my surprise it began to widen out again. At this I scratched my head, but had still no notion of the truth: until at last I came to a rising ground, and it burst upon me all in a moment that I was cast upon a little barren isle, and cut off on every side by the salt seas.

Instead of the sun rising to dry me, it came on to rain, with a thick mist; so that my case was lamentable.

I stood in the rain, and shivered, and wondered what to do, till it occurred to me that perhaps the creek was fordable. Back I went to the narrowest point and waded in. But not three yards from shore, I plumped in head over ears; and if ever I was heard of more, it

was rather by God's grace than my own prudence.[1] I was no wetter (for that could hardly be), but I was all the colder for this mishap; and having lost another hope was the more unhappy.

And now, all at once, the yard[2] came in my head. What had carried me through the roost would surely serve me to cross this little quiet creek in safety. With that I set off, undaunted, across the top of the isle, to fetch and carry it back. It was a weary tramp in all ways, and if hope had not buoyed me up, I must have cast myself down and given up. Whether with the sea salt, or because I was growing fevered, I was distressed with thirst, and had to stop, as I went, and drink the peaty water out of the hags.[3]

I came to the bay at last, more dead than alive; and at the first glance, I thought the yard was something farther out than when I left it. In I went, for the third time, into the sea. The sand was smooth and firm, and shelved gradually down, so that I could wade out till the water was almost to my neck and the little waves splashed into my face. But at that depth my feet began to leave me, and I durst venture in no farther. As for the yard, I saw it bobbing very quietly some twenty feet beyond.

I had borne up well until this last disappointment; but at that I came ashore, and flung myself down upon the sands and wept.

The time I spent upon the island is still so horrible a thought to me, that I must pass it lightly over. In all the books I have read of people cast away, they had either their pockets full of tools, or a chest of things would be thrown upon the beach along with them, as if on purpose. My case was very different. I had nothing in my pockets but money and Alan's silver button; and being inland bred, I was as much short of knowledge as of means.

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[1] **prudence:** being wise in handling practical matters
[2] **yard:** a wooden pole used to support a square sail on a boat
[3] **hags:** a peat bog

14307038

54 In lines 1 through 21 of "Excerpt from *Kidnapped*," how does the setting contribute to the mood? Use **two** details from the story to support your response.

14307040

55 What do lines 22 through 29 in "Excerpt from *Kidnapped*" reveal about the narrator's character? Use **two** details from the story to support your response.

Directions

307040P

Read this article. Then answer question 56.

A Sticky Problem for Farmers

by Nathan Aaseng

TIRED OF WRESTLING WITH THE ROCKY, stump-cluttered soil of New England, farmers in the early 19th century often followed rumors of better land to the midwestern United States. There, in states such as Illinois and Iowa, they found just what they were looking for: prairies full of rich, black dirt that promised to pump life into seeds as fast as they were planted.

Unfortunately, many settlers soon felt like thirsty sailors in the middle of the ocean—water everywhere but not a drop to drink. Rich soil surrounded them, but their equipment could not plow it. That was the problem a blacksmith named John Deere faced when he arrived in Grand Detour, Illinois, in 1836.

His Illinois neighbors had been desperate for a blacksmith ever since they had settled in Grand Detour. No sooner did Deere set foot in town than he found a line of farmers eager to offer him business. Two days after his arrival in Grand Detour, he was hard at work fixing broken equipment.

While working at his shop, Deere frequently heard complaints from farmers about the soil. Their early excitement about the richness of the soil and the ease with which a plow could break the sod had turned to frustration. The soil was too rich. Instead of falling away from the plow like sandy New England soil, it stuck. Farmers had to stop every few seconds to scrape the clumped dirt off their iron plowshares with large wooden paddles. They might as well have been plowing through a rocky field for all the progress they were making. Some farmers were so discouraged by the sticky soil that they left in search of new land; others were ready to join them.

Deere decided to look into the problem. From his previous work on plows, he knew that dirt was less likely to stick to highly polished metal. That thought was in the back of his mind when he visited a sawmill in 1837 and noticed a broken circular saw made of steel, a polished metal that was too expensive to be widely used for implements. Steel had never been used to make a plowshare.[1]

Deere took the broken saw blade home with him and began working on a better plow. He knew that polished steel was not the whole answer; the shape of the plow's bottom was also important.

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[1] Historians now believe that the first steel plowshare was made by John Lane in 1833. However, John Deere was the first to make steel plowshares commercially successful.

The plow Deere wanted to make would have to cut deeply into the soil at a sharp angle so that dirt would fall off, yet it could not put too much burden on the horses pulling it. After some experiments, Deere found the curved shape he needed and pounded the steel saw blade into that shape. He then built a plow, complete with oak handles, and brought it to the farm of his neighbor, Lewis Crandall.

While an anxious crowd of Grand Detour farmers watched, Crandall tried the new plow. He pronounced it a success. Not only did dirt fall away cleanly from the blade, but the plow also turned the soil more quickly than the old cast-iron plows.

Other farmers wanted one of Deere's "self-scouring" plows. The blacksmith could not meet the instant demand, however. For one thing, polished steel was hard to find. Deere could not count on a steady supply of broken saw blades to use as raw material. Steel was only available from England, and it was expensive to import. There was no such thing as mass production in the blacksmithing business; plows were made one at a time according to each customer's needs. Deere and his new partner in the business, Leonard Andrus, manufactured only 2 "self-scouring" plows in 1838 and 10 the following year.

Production gradually increased, however, as Deere imported greater quantities of expensive English steel. Forty handmade plows left his shop in 1840 and, after expanding his workshop to include a foundry in 1843, Deere's production rose to 400 plows a year.

Until then, Deere still considered himself a blacksmith—his plow was just one part of his craft. But after seeing that he could easily sell as many plows as he could make, even using costly English steel, the blacksmith decided to devote his time to manufacturing plows. In 1846 he found a Pittsburgh steel firm that could supply him with all the steel he needed for a lower price than what the English steel cost. The following year, he moved his business to Moline, Illinois, where the Mississippi River provided water power and transportation.

During the early years, Deere's sales strategy consisted of loading a wagon with plows and visiting farms until all his merchandise was sold. He rarely had to travel far. Producing plows before they were ordered was an innovative approach to sales. By 1857 the company, which he had reorganized with new partners under the name John Deere & Company, was making and selling 10,000 plows a year—nearly seven times as many as he had sold just seven years earlier.

A relentless perfectionist, Deere kept tinkering with his plows, trying to make them better. He came out with 10 new versions of his plow in a single year. While this slowed down his production ability, it ensured Deere a solid reputation among his customers. Deere plows became world famous in the 1870s when they outshone the competition in a demonstration in France. That same decade, the company built its first riding plow and designed the leaping deer as its trademark.

14307023

56 In "A Sticky Problem for Farmers," how do lines 14 through 21 contribute to the rest of the article? Use **two** details from the article to support your response.

Directions

307037P

Read this article. Then answer questions 57 through 59.

Lewis Latimer

by Stephen Currie

Though electric light was slow to catch on among the public, it was evident to scientists and inventors across America that a new age was dawning. Electricity, they realized, was the wave of the future.

Lewis Latimer

One of the first Americans to recognize the potential of electricity was a black man named Lewis Latimer. Born in Massachusetts in 1848, Latimer served in the U.S. Navy during the Civil War. When the war was over, Latimer returned to Massachusetts and got a job with a law firm that specialized in patents and inventions. At first he worked as an office boy, delivering messages and doing other simple tasks that involved little responsibility. Assignments like these made some sense, given his youth and relative inexperience. It is also likely, however, that Latimer's race kept him from being considered for positions that carried more authority—and a larger paycheck.

Latimer did not wish to remain an office assistant for long, though. He soon became intrigued by the work of the company's draftsmen. To apply for a patent, inventors had to provide careful pictures that showed every detail of their inventions. Because most inventors did not have the skill to execute these pictures on their own, patent lawyers typically had expert draftsmen on staff to create the diagrams. Latimer resolved to learn everything he could about drafting. He studied drawing techniques at home and practiced them whenever he could. Before long, his bosses recognized his talent and promoted him to the post of draftsman. By 1875 he was the head draftsman for the firm. As a later newspaper report put it, Latimer had been "thrust upward by his singular talent and drive."

Latimer's drawing work brought him into contact with many inventors. The most famous of these was Alexander Graham Bell, best known as the inventor of the telephone. Latimer made several drawings which helped Bell claim the patents he sought. To draw these designs as accurately as possible, it was necessary for Latimer to learn as much as he could about Bell's work. In the process Latimer became interested in the principles of electricity, principles which underlay much of what Bell was doing. As Latimer read more and more about electric power, he became convinced that this form of energy could help Americans in new and important ways.

Patents

In the late 1870s Latimer began looking for a job that would allow him time to pursue his new interests in technology. He was eventually offered a position at a company called the United States Electric Lighting Corporation. The head of the company, Hiram Maxim, was already well known among scientists for his work with electric power. Though Thomas Edison had already patented the first truly effective electric light bulb, Maxim believed he could improve on Edison's design. In particular, Maxim thought he could increase the life span of the bulb. Toward that end, he hired the most intelligent and hard-working people he could find—including Latimer.

Latimer spent his first few months in Maxim's employ trying to improve the bulb's filament—the wirelike assembly inside the bulb that gives off the actual light. In 1881, just a year after joining Maxim's firm, Latimer and a colleague patented a new and more efficient way of making filaments, using what their application called "a continuous strip of carbon secured to metallic wires." The new procedure resulted in better, cheaper light bulbs even than Edison had been able to produce. In the next months Latimer went on to patent several more inventions, each of which made light bulbs longer lasting and easier to manufacture—and each of which brought more money to the corporation. Maxim's confidence in Latimer had paid off.

Latimer did not spend all his time inventing. His work had made him an authority on electric lighting, and Maxim consequently gave him more and more responsibility. Maxim sent him to Philadelphia and other U.S. cities to oversee factory operations. Later, Latimer traveled to England to set up a new factory and to Montreal, Canada, to guide workers in installing electric lights in train stations. In Montreal he even learned some French to communicate with employees who spoke little or no English. "This was my mighty lesson," he wrote years later. "My day was spent climbing telegraph poles and locating arc lamps on them with the assistance of my laborers who seemed much impressed with my effort to speak their native language."

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57 How did Lewis Latimer's decision in lines 16 and 17 lead to partnerships with other inventors? Use **two** details from the article to support your response.

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58 What impression of Lewis Latimer did the people who worked with him have? Use **two** details from the article to support your response.

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59 Both Lewis Latimer and John Deere were determined to succeed. How were their paths to success similar? How were their paths to success different? Use details from **both** articles to support your response.

In your response, be sure to
- explain how their paths to success were similar
- explain how their paths to success were different
- use details from **both** articles to support your response