Directions

Read this story. Then answer questions 8 through 14.

Drawing Horses

by Cerelle Woods

I'd give anything to draw horses the way Euphemia Tucker does. She draws them in the margins of spelling tests and on the back of her math homework. They're always running wild and free, their manes swirling over the paper like clouds across the sky.

Euphemia's horses look so real you can almost feel their breath on your face.

Luke Anderson, who sits next to me, says he can't decide whether my horses look more like Great Danes or kitchen tables. He also calls me Messy. I prefer Marisa, which is my real name, to Missy, which is what everyone—except Luke—calls me. If I could draw like Euphemia, I'd sign all my pictures Marisa. Nobody messes with Euphemia's name, not even Luke Anderson.

Today I sharpened my pencil and took a clean sheet of paper out of my desk. Then I closed my eyes and pictured one of Euphemia's perfect horses rearing up and pawing the air with its sharp hooves. I could see it so clearly I was sure I'd be able to draw it this time.

I started with what I do best: a big, billowing mane. Next I roughed in most of the body and drew a long tail streaming out behind. It really wasn't turning out half bad until I got to the front-legs-pawing-the-air part, which looked more like two macaroni noodles with tiny marshmallows for hooves.

I tried again, but the hooves still didn't seem right, and rather than doing them over and over, I erased them and went on to the head. That was when I really ran into trouble.

First I drew some great donkey ears, followed by sheep ears, pig ears, kangaroo ears . . . everything except horse ears. I erased again and again until I had rubbed a hole in the paper. That was when Luke Anderson poked his nose over my shoulder.

I scratched a big X through my earless, macaroni-legged horse, wadded it up into a little ball, and stuffed it under the lid of my desk.

I was still upset when I got off the school bus this afternoon. I walked past the neighbors' horses standing in the field next to our house. They've been in that field for as long as I can remember. Their stringy manes never float into the sky. Their ragged old tails hang straight down to the ground, and I've never seen them run.

GO ON

I brooded about it all through dinner. After I'd helped clear the dishes, I sat down with a stack of typing paper and a freshly sharpened pencil. Without Luke Anderson there to pester me, I hoped I'd have better luck. I practiced a few horses' heads, trying to get the ears right. Nothing worked.

I tossed all the sketches into the trash and walked outside. The sun had just sunk below the horizon, feathering the whole sky with pink and orange wisps. Everything looked special in that light, even the scraggly horses next door.

I dragged a lawn chair over to the fence and sat down to take a better look at them. They'd never be free spirits like Euphemia's horses, but they did seem patient and strong. I noticed the curves of their muscles, the shadows on their faces, the shine along their backs. Their colors reminded me of dessert—rich chocolate, deep cinnamon, creamy caramel.

I was just sitting there, feeling kind of dazzled by the unexpected beauty of it all, when I remembered the big box of pastels my grandmother had sent.

An idea began to take shape in my mind, and just then the cinnamon horse turned its head toward me and nodded three times. It was like a sign.

I hurried into the house, grabbed the pastels and some paper, and raced for the door.

I choose a deep brown, pulling it across my paper in the shape of the chocolate horse. It comes out right the first time, even the legs and ears! Drawing horses is easier when they're right in front of you, and I'll say this for the ones next door—they hold their poses.

The sky is turning out just as I'd hoped, too; all the pinks and reds blending together like a strawberry parfait, and I love the way the caramel horse's mane is blowing, just barely, in the wind.

It doesn't look exactly like one of Euphemia's horses, of course. But I already know that when this drawing is finished, I'll be signing it Marisa.

8 In line 3, what does the simile "like clouds across the sky" help the reader understand about the horses in Euphemia's sketches?

A They are drawn sloppily.

B They look like they are in motion.

C They are getting tangled up with each other.

D They look like they are trotting through fog.

9 How do lines 14 through 16 contribute to the development of the plot?

A They establish Marisa's problem.

B They emphasize Marisa's hopefulness.

C They contrast Marisa's artistic abilities with Euphemia's.

D They illustrate Marisa's determination to not let Luke bother her.

10 Which phrase **best** conveys the tone in lines 1 through 30?

A "They're always running wild and free. . ." (lines 2 and 3)

B "He also calls me Messy." (lines 8 and 9)

C "Next I roughed in most of the body. . ." (lines 17 and 18)

D "I scratched a big X through my earless, macaroni-legged horse, . . ." (line 26)

11 Read this sentence from line 32.

I brooded about it all through dinner.

What effect does the word "brooded" have in the story?

A It shows Marisa's anxiety about her abilities.

B It reveals Marisa's motives for drawing.

C It emphasizes how Marisa is growing as a character.

D It indicates Marisa has a major decision to make.

12 How do lines 36 through 38 help convey the theme of the story?

A They show that some situations take time to change.

B They prove that practice can help natural talents to develop.

C They suggest that inspiration may come in unexpected ways.

D They demonstrate that new ideas will eventually be accepted.

13 Which sentence **best** explains why Marisa's final horse drawing was different than her first tries?

A "Everything looked special in that light, even the scraggly horses next door." (lines 37 and 38)

B "I noticed the curves of their muscles, the shadows on their faces, the shine along their backs." (lines 42 through 44)

C "An idea began to take shape in my mind, and just then the cinnamon horse turned its head toward me and nodded three times." (lines 49 and 50)

D "I choose a deep brown, pulling it across my paper in the shape of the chocolate horse." (line 52)

14 How does Marisa change while watching her neighbors' horses?

A She realizes that Euphemia's horses do not look realistic, so she decides to try to draw better pictures than her friend.

B She decides to try a different way of drawing and is proud of her work.

C She realizes she can never be an artist like Euphemia but wants to draw like her anyway.

D She finally learns that drawing horses is easier with proper lighting and art supplies.

Directions

Read this story. Then answer questions 15 through 21.

Excerpt from *The Black Pearl*

by Scott O'Dell

I had put the seventh pearl on the scales and was carefully setting the small copper weights to make them come to a proper balance when I heard my father's steps outside the office. My hand shook at the sound and one of the weights slipped from my fingers. A moment later the heavy iron door swung open.

My father was a tall man with skin turned a deep bronze color from the glare of the sea. He was very strong. Once I saw him take two men who were fighting and grasp them by the backs of their necks and lift them off the ground and bump their heads together.

He came across the room to where I sat at the desk on my high stool and glanced at the ledger.

"You work with much rapidity," he said. "Six pearls weighed and valued since I left this morning." He wiped his hands on the tail of his shirt and took a pearl from the tray. "For this one," he said, "what is your notation?"

"Round. Fair. Weight 3.5 carats," I answered.

He rolled the pearl around in the palm of his hand and then held it to the light.

"You call this one only fair?" he asked. "It is a gem for the king."

"For a poor king," I said. After four months of working with my father I had learned to speak my mind. "If you hold it closer to the light, you will see that it has a flaw, a muddy streak, about midway through."

He turned the pearl in his hand. "With a little care the flaw can be peeled away," he said.

"That, sir, I doubt."

My father smiled and placed the pearl back in the tray. "I doubt it also," he said and gave me a heavy pat on the back. "You are learning fast, Ramón. Soon you will know more than I do."

I took a long breath. This was not a good beginning for the request I wanted to make. It was not good at all, yet I must speak now, before my father left. In less than an hour the tide would turn and the fleet sail from the harbor.

"Sir," I began, "for a long time you have promised me that when I was sixteen I could go with you and learn how to dive for pearls. I would like to go today."

My father did not reply. He strode to the slit in the wall and peered out. From a shelf he took a spyglass and held it to one eye. He then put the spyglass down and cupped his hands and shouted through the slit.

"You, Ovando, leaning against the cask, send word to Martin, who leans against the tiller of the *Santa Teresa*, that there is much work to do and little time in which to do it."

My father waited, watching through the slit, until his message was sent forward by Ovando.

"If you go with the fleet," he said, "then all the male members of the Salazar family will be on the sea at once. What happens if a storm comes up and drowns the both of us? I will tell you. It is the end of Salazar and Son. It is the end of everything I have worked for."

"The sea is calm, sir," I answered.

"These words prove you a true landsman. The sea is calm today, but what of tomorrow? Tomorrow it may stand on end under the lash of a chubasco."[1]

"It is still a week or two before the big wind comes."

"What of the sharks? What of the devilfish that can wring your neck as if it were the neck of a chicken? And the giant mantas by the dozens, all of them the size of one of our boats and twice as heavy? Tell me, what do you do with these?"

"I have the knife that grandfather gave me."

My father laughed and the sound bounded through the room like the roar of a bull.

"Is it a very sharp knife?" he asked scornfully.

"Yes, sir."

"Then with much luck you might cut off one of the eight arms of the devilfish, just before the other seven wrap around you and squeeze out your tongue and your life."

I took another breath and brought forth my best argument.

"If you allow me to go, sir, I shall stay on deck while the others dive. I shall be the one who pulls up the basket and minds the ropes."

I watched my father's face and saw that it had begun to soften.

"I can take the place of Goleta," I said quickly, to follow up the advantage I had gained. "There is an apology to make, sir. At noon Goleta's wife came to say that her husband is sick and cannot sail. I forgot to tell you."

[1] **chubasco:** a strong storm

My father walked to the iron door and opened it. He looked at the sky and at the glossy leaves of the laurel trees that hung quiet on their branches. He closed the door and put the tray of pearls in the safe and turned the bolt.

"Come," he said.

15 Read line 15 of the story.

"You call this one only fair?" he asked. "It is a gem for the king."

What does this line suggest about the father?

A He has not looked at the pearl as closely as Ramón has.

B He does not think that Ramón is correct about the pearl.

C He is testing Ramón's confidence in judging the pearl's value.

D He is teaching Ramón about the pearl's quality.

16 Which detail from the story **best** supports the idea that Ramón is becoming an expert at judging pearls?

A "'For this one,' he said, 'what is your notation?'" (lines 11 and 12)

B "'For a poor king,' I said." (line 16)

C "'With a little care the flaw can be peeled away,' he said." (lines 19 and 20)

D "I would like to go today." (line 29)

17 Why is the father reluctant to bring Ramón on a pearl-diving trip?

A He is concerned for Ramón's safety.

B He needs Ramón to evaluate more pearls.

C He thinks Ramón is still too young to sail.

D He is unsure Ramón is ready to dive.

18 In line 55, why does Ramón suggest that he will "stay on deck while the others dive"?

A His father needs him to help with other jobs on the boat.

B He realizes that his father will never actually let him go.

C His father has convinced him that it is too dangerous.

D He is trying to gradually change his father's mind.

19 How does line 57 **best** contribute to the development of the story?

A by signaling a turning point

B by providing a solution to the problem

C by comparing the characters' actions

D by introducing a new conflict

20 How does the father change during the story?

A He becomes concerned about a diver's health.

B He begins to acknowledge Ramón's maturity.

C He becomes frustrated by Ramón's persistence.

D He stops worrying about his family business.

21 The author develops Ramón's point of view in the story **mostly** by

A describing Ramón's fear of pearl diving

B including Ramón's analysis of the pearl

C describing how Ramón feels about his father

D including dialogue between Ramón and his father

Directions
Read this article. Then answer questions 29 through 35.

Move Over, Spider-Man—Here's Spider-Goat!

by Joli Allen

Making silk threads isn't just for spiders anymore. A special type of goat is doing it, too. Nubian goats look and act like any other playful, floppy-eared goats. But when they aren't playing, these goats are busy making spider silk.

Spider silk is absolutely amazing. It's five times stronger than steel, but it's also very light and flexible. Because of this, scientists plan to use it to make some totally cool things! Imagine clothing that's as light as a cobweb, yet won't tear, or fishing line and tennis racket strings that won't break. Doctors might be able to use spider silk for making tiny stitches in delicate eye surgery, but it could also be strong and flexible enough to replace some worn-out parts of the human body. The silk also could be used to build airplanes, buildings, and bridges, as well as create a tough coating for space stations. Because of all these possibilities, scientists have been searching for ways to make spider silk in huge quantities, and they have finally found the answer: Nubian goats!

Scientists have studied spider silk for years. They tried to raise spiders on spider farms to collect silk from them, but the spiders didn't enjoy living so close to one another. Spiders like their own space, and when they don't get it . . . well . . . they make space by eating their neighbors!

Goats, the scientists discovered, are much friendlier than spiders and are also easier to work with. Because they're bigger, a few goats can produce more silk than a roomful of spiders. The scientists chose Nubian goats for this job because they make milk at a younger age than many other goats. So, the Nubian goats will make spider silk sooner and for longer periods of time.

But how do the goats actually make the spider silk? That's what scientist Jeffrey Turner wanted to figure out when he taught animal science at McGill University in Montreal. He noticed that the body parts of spiders that make silk and the parts of goats that make milk are very much alike. Because of this, he figured that goats might be able to make spider silk. The idea excited him, and he started his own company in 1993 to do more research on how goats could do what spiders have been doing for years.

Eventually, Turner and his fellow scientists found a way to place spider genes in goats so that the genes fit nicely, like a guest in a comfortable hotel. Every living animal, including humans, has a set of genes inside of it that tells its body what to do. These genes are very, very tiny, but they hold lots of information on how to build parts of the body. A spider's genes contain instructions for making spider silk, and a goat's genes contain instructions for making milk. So by putting spider genes into goats, the goats then have the genes that tell their bodies how to make spider silk proteins.

Proteins are the body's basic building blocks. Just as people have proteins in their bodies that make their hair, skin, and muscles, the goats now have special proteins for making spider silk. When the goats produce milk, the spider silk proteins are in it, but it looks just like regular milk. Scientists separate the proteins out of the milk by skimming off the fat and then sprinkling salt on it. The salt makes the spider silk proteins curdle into small clumps. These clumps are scooped out, and water is added until the mixture has the thickness of maple syrup. This is spider silk, and it's ready to be spun!

Next, the silk is taken to a spinning machine that copies the way spiders spin their silk. The secret to extra strong silk is in how the spiders spin it: they stretch the silk over and over again. The stretching makes all the protein building blocks line up, lock together, and form a strong but flexible band. When the giant spinning machine is finished, the silk threads are stronger than steel and as flexible as rubber . . . but they're also thinner than a human hair.

Producing milk with spider proteins in it doesn't hurt the goats. Scientists did years of research to make sure the goats would be safe and healthy. The milk that's left after the spider proteins are removed can still be used—as fertilizer on fields that grow feed for the goats.

In 1998, Dr. Turner bought a farm in Canada for raising his spider-silk goats, and they still live there today. The one thousand goats that make spider silk are raised in a normal environment and are healthy, curious, and energetic—just like any other Nubian goats. Their owner gives them lots of space to roam and play. The goats particularly enjoy rolling down the farm's grassy hills, and they love listening to country music. Other music, such as rock music, has strange rhythms that make the goats jittery, but the steady beat of country music keeps them calm and happy. H'm . . . I wonder if they'd like the "Itsy Bitsy Spider" song.

29 In lines 4 through 12, the author explains why scientists are trying to find a way to produce spider silk using goats by showing

A possible uses for spider silk

B the popularity of spider silk

C how easy spider silk is to use

D how quickly spider silk can be developed

30 Which statement **best** explains an advantage of using goats rather than spiders for the production of silk?

A Goats produce stronger silk than spiders do.

B Scientists can insert genes into goats but not into spiders.

C Spider proteins in goat milk can be spun into silk.

D Goats are bigger than spiders and are much easier to raise.

31 What did Jeffrey Turner discover about using Nubian goats for possible silk production?

A Nubian goats already make a similar substance.

B Nubian goats have high amounts of protein in their milk.

C Nubian goats and spiders both prefer living in large groups.

D Nubian goats and spiders have body parts that are similar.

32 In the process described in lines 35 through 47, which step allows the threads to become strong enough for surgical procedures?

A The silk proteins are turned into clumps.

B The silk is stretched repeatedly.

C Salt is added to the goat's milk.

D Water is added to thin the clumps.

33 Why are lines 55 through 59 important to the article?

A They suggest that the goats are unusual.

B They explain how the goats are kept busy.

C They explain that the goats are treated well.

D They suggest that the goats are like humans.

34 Which statement **best** expresses a central idea of the article?

A Nubian goats produce better quality silk than spiders.

B Spider silk is a complex substance that takes effort to make.

C Nubian goats have been genetically altered to produce spider silk.

D Spider silk contains proteins that are similar to proteins in other living things.

35 Which detail is **most** important to include in a summary of the article?

A Scientists have made an attempt to gather silk from spiders living on farms.

B Spider silk has qualities that can be used in many products.

C A scientist started a company to research goat silk.

D Machines spin spider silk into thin threads.

STOP

Directions

Read this story. Then answer questions 36 through 42.

Nina has just received a low grade on a social studies test. Before she can figure out what to do, the bell rings and she heads to her art class.

Excerpt from *Interference Powder*

by Jean Hanff Korelitz

The art studio was at the end of the corridor. Its walls were splotched by years of flung paint, and pockmarked from thousands of thumbtacks. All sorts of stuff was pinned up, from kindergarten smudges to our own collage self-portraits, with papier-mâché objects dropping down from the ceilings to sway over our heads. One of my own paintings hung on the wall between two of the windows, and I smiled when I saw it. It was a picture I was kind of proud of: a study of Isobel's face, up close, her thin smile stretching across her face and her skin very white against a purple background. Isobel called this her vampiress portrait, which wasn't exactly a compliment. Still, I knew she liked the picture and felt proud to see it up on the wall.

When we got to the art room, I was surprised that Mrs. Smith, our teacher, was absent and in her place stood a tall woman with long hair in hundreds of little braids, some of them with beads and shells woven into their ends. The hair was mostly gray, but the woman's face wasn't really old. In fact, she looked around the same age as my mom. She grinned at us from the center of the room, with her hands thrust deep into the pockets of her big, faded apron, which she wore over jeans so worn they looked buttery-soft. In one ear she wore a long, dangly earring with a feather that brushed her shoulder. Nothing was in her other ear. Her fingers were bare, but her wrists clattered with little bracelets, silver and gold and every color. I stared at those bracelets. I had never seen anything like them.

Our class was bunched up at the door, uncertain about whether or not to enter, given that our art teacher wasn't there; but this different person motioned us inside, grinning all the while. "Come on!" she said gleefully. "Mrs. Smith is sick today, so I was called in. My name is Charlemagne."

Charlemagne! Isobel and I exchanged a look. Only the week before, Isobel's father had shown us a print of an old painting with a man in a chair. Four priests were standing over him, waving something that looked like palm fronds.[1]

"Is he a saint?" Isobel had asked.

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[1]**fronds:** branches

Her dad had laughed. "He thought he was. But no. He's King Charlemagne of France. Charles the Great! He made war on absolutely everybody."

And now, here we were, only a week later, confronted with one of Charles the Great's actual descendants, since what else could Ms. Charlemagne be? Imagine being descended from a medieval French king! How totally thrilling! Mom always told me that her great-great-great-uncle had invented the glue they use on the back of postage stamps, but that was nothing compared to being connected to ancient royalty.

Ms. Charlemagne began passing out paper as we drifted to the art tables. "I don't have any special plan today," she said. "I think we'll just see where our creativity takes us. Let's see what happens on the page. After all, that's what artists do, isn't it?"

Was it? I'd always thought they planned their paintings beforehand and then tried to make the picture on the canvas match the picture in their mind. That's what I always did, anyway.

The kids around me were picking through the pencil and crayon bins, looking at one another with uncertain expressions. They were used to being told by Mrs. Smith what the day's subject was or how they were supposed to make their pictures.

"Let's let the colors pick themselves!" Ms. Charlemagne chirped. "Let's let the pictures tell us what they should look like! Let's see what's on your mind today!"

I looked down at my blank white sheet. I knew what was on my mind. My low 62 grade, my never-to-be-had singing lessons, my mom's expression when she sees my test score tonight. I sighed and reached for a pencil. I began to draw my mother in our kitchen at home, her face pinched up in a frown. I drew her thin eyebrows and her eyes, with their pretty, curling eyelashes, looking down. I drew her hair falling forward a bit and one hand, the one that still wore my father's wedding ring, on the table before her. Next to that hand I drew my test; and just to make myself feel even worse, I drew my ugly score—62—right there on the paper. For a long moment I glared at it, as if willing it to change.

Then it struck me! I *could* change that number, at least here if not in real life. I could turn my pencil over and rub those terrible numbers away, then write new numbers in their place. I was the lord of my own picture, wasn't I? I could give myself a 63 on my social studies test, or a 61, or . . . why not even a perfect 100?

36 How does Nina's attitude toward Ms. Charlemagne change?

A Nina becomes less interested after noticing Ms. Charlemagne's bracelets.

B Nina becomes more fascinated after learning Ms. Charlemagne's name.

C Nina becomes less surprised after hearing Ms. Charlemagne's viewpoints.

D Nina becomes more suspicious after hearing Ms. Charlemagne's assignment.

37 How do lines 34 through 39 contribute to the development of the story?

A by suggesting that Ms. Charlemagne is not qualified to teach art

B by introducing Nina to a new way to think about art

C by showing that Ms. Charlemagne does not understand how artists work

D by describing the way Nina usually completes art assignments

38 Why does the author use the word "chirped" in line 43 of the story?

A to reveal that Ms. Charlemagne has creative ideas

B to imply that Ms. Charlemagne is new at teaching art

C to demonstrate that Ms. Charlemagne has a cheerful outlook

D to show that Ms. Charlemagne easily relates to the art students

39 Read this sentence from line 54.

I *could* change that number, at least here if not in real life.

How does this sentence **best** contribute to the development of the story?

A by signaling a change in Nina's thinking

B by emphasizing the importance of the setting

C by revealing Nina's strong feelings

D by suggesting a new plot development

40 Which quotation **best** supports a theme of the story?

A "Still, I knew she liked the picture and felt proud to see it up on the wall." (lines 8 and 9)

B "I had never seen anything like them." (line 18)

C "Imagine being descended from a medieval French king!" (lines 30 and 31)

D "I was the lord of my own picture, wasn't I?" (line 56)

41 Based on details in the story, what can readers conclude about Ms. Charlemagne?

A She is a respected artist.

B She has a famous relative.

C She has a unique personality.

D She is a popular substitute teacher.

42 How do the details in the story help develop a theme?

A Nina's thoughts about her mother help develop the theme that being honest will make you feel better.

B Nina's interaction with Isobel helps develop the theme that experiencing a new situation is easier with a friend.

C Nina's drawing helps develop the theme that expressing yourself can help you work through your struggles.

D Nina's description of Ms. Charlemagne helps develop the theme that judging others by their appearance is not a good idea.

Directions
Read this article. Then answer questions 43 and 44.

"Ideas That Work . . . and Those That Don't" from *When is a Planet Not a Planet? The Story of Pluto*

by Elaine Scott

Today, scientists do their work in much the same way that Kepler and Newton did. They begin with *observation*—carefully watching how something works. After some time of observation, they develop a *hypothesis*, which is a scientific explanation based on what they have observed. Using hypotheses, scientists can make predictions about what they expect to happen. For example, a researcher could have a hypothesis that a particular germ causes a disease. Or an expectation that a new planet can be found in a certain area of the night sky. A hypothesis is just an idea or an educated guess, until it is tested.

Scientists test their hypotheses over and over again. If the results don't disprove the hypothesis, they ask other scientists to test their hypotheses also. And if those tests produce identical results, the hypothesis becomes a *theory*. Scientists then begin to count on the theory being true.

You've probably developed theories of your own. For example, you may begin with an observation that the school cafeteria serves chocolate-chip cookies on Friday. From that observation, you might make the hypothesis that, on Fridays, the cafeteria will *always* have chocolate-chip cookies. If the cafeteria serves chocolate-chip cookies for six Fridays in a row, your hypothesis would appear to be correct. When more Fridays pass, and chocolate-chip cookies appear every time, you begin to operate on the theory that Friday is chocolate-chip-cookie day. If you were very confident, you would create your own cafeteria *law* that says Friday will always be chocolate-chip-cookie day. However, scientific theories—and even laws—can change if new information is discovered. If a new cook starts working in the cafeteria and serves chocolate-chip cookies on Tuesday, your law would be broken, and your hypothesis and theory would have to change, too. Scientists must always be willing to abandon their theories when new information comes along that contradicts those theories.

Until 1781, everyone operated on the theory that Mercury, Venus, Earth, Mars, Jupiter, and Saturn were the only planets in our solar system.

Then, in 1781, an English astronomer named William Herschel (1738–1822) discovered Uranus.

Twenty years later, on January 1, 1801, an Italian priest and astronomer, Giuseppe Piazzi (jo-SEP-ee pee-AHT-see), who lived from 1746 to 1826, was looking through his telescope. He saw a bright object—something new and different—traveling from east to west. It was large, about one-third the size of our Moon. Piazzi shared his discovery with other astronomers, and they determined Piazzi had found another new planet. It was named Ceres (SAIR-eez). But the following year, astronomers found an object similar to Ceres in the same orbit. Then they found another. And another. The astronomers were puzzled. Could there be *that* many new planets? William Herschel suggested they give these small objects a new name: "asteroids." More and more asteroids were found. They were whizzing around in space, orbiting the Sun, just like Ceres. Astronomers named this region of space the Asteroid Belt.

Then in 1846, a German astronomer named Johann Gottfried Galle (GOL-lee) (1812–1910) discovered Neptune. Now there were nine planets in the solar system.

Before long, however, astronomers began to change their minds about Ceres. Though it was much larger than other bodies traveling in the Asteroid Belt, Ceres wasn't traveling by itself, in its own orbit, as each of the planets did. Ceres was traveling with the asteroids. Also, compared to the other planets, Ceres was very small! Astronomers finally decided that Ceres was an asteroid—one of the largest, but still an asteroid. So Ceres was demoted.

And the solar system returned to eight planets.

Percival Lowell (1855–1916) was a successful American businessman, travel writer, and diplomat. He was not a professional astronomer, though he loved to study astronomy. In 1894, using his own money, he established the Lowell Observatory in Flagstaff, Arizona.

Lowell was fascinated with Mars, but he had another abiding interest. He hoped to find a ninth planet—one he called Planet *X*. As he studied the recently discovered Neptune, he noticed that the planet wobbled as it orbited. Using Newton's and Kepler's laws, Lowell decided that Neptune might be wobbling because the gravity of another, unseen, planet was tugging on it. He used the laws of physics to help pinpoint where this mysterious new Planet *X* might be found. Sadly, when Lowell died in 1916, he had still not found it. But in 1929, astronomers at the Lowell Observatory decided to look for Planet *X* again. A young astronomer, Clyde Tombaugh (1906–1997), used Percival Lowell's calculations to search the night skies. On February 18, 1930, he found what he was looking for—the smallest and farthest planet, Pluto.

But in time, there were problems with Pluto.

43 What is the meaning of the word "contradicts" as it is used in line 24 of the article? Use **two** details from the article to support your response.

44 How do lines 25 and 26 contribute to the development of a key idea in the article "'Ideas That Work . . . and Those That Don't' from *When is a Planet Not a Planet? The Story of Pluto*"? Use **two** details from the article to support your response.

Directions

Read this article. Then answer question 45.

Building for "Pests": Critters Need Houses, Too

by Lela Nargi

Sometime in the middle of the Stone Age, say 9000 B.C., our ancestors moved house—from temporary, tent-like structures to more enduring abodes that might last a lifetime or longer. Thousands of years later, they started making simple houses for the creatures they cared for, too. By the 7th century A.D., the Chinese were even building pens for their elephants!

As time went on, people dreamed up bigger, fancier digs for both their families and their animals. Explains Dr. Carol Krinsky, a professor of art and architectural history at New York University: In 17th-century France, "Horses were so important for transportation. And they were symbols of prestige. So the stables at Versailles"—the palace outside Paris built by King Louis XIV—"are overwhelmingly glamorous."

These days, fancy mini-houses show how much we value our beloved dogs and canaries. But ecologically minded architects around the world are thinking up ways to make houses, not for pets, but for *pests*!

Creatures + Comfort

Dr. Joyce Hwang is a professor of architecture at the University of Buffalo. According to her, a "pest" is any animal people don't want around. "But that differs from country to country, city to city, even person to person," she says. "In some places, pigeons are considered pests, while in others"—like Turkey and Belgium, where pigeon racing is a popular sport—"they are valued."

Hwang wants the homes she designs for bats, bees, squirrels, and other critters to look cool and beautiful. Her reason: "Well-designed architecture is able to bring attention to a situation." In the case of bats, the situation is White-Nose Syndrome. This is a fungus that's infesting bats' caves and killing them. Seven million bats have died from it in North America so far.

"Many people are afraid of bats," says Hwang. "They think of them as animals that transmit rabies. But bats are so helpful to humans as predators of insects (they can eat lots of mosquitoes!) and as pollinators." (That is, they transmit pollen from flower to flower on trees like peaches and avocadoes, fertilizing them so they'll grow into fruit.) "Good architecture will make people curious about bats," says Hwang. And maybe make them want to help, as well.

So far, Hwang has built two kinds of houses for bats: Bat Tower, a zigzag of plywood that she and some of her students set up beside a bug-infested pond. And Bat Cloud, a clump of cozy pods that hang in the middle of a nature preserve. She designed them both carefully, to give bats the warmth they require and the rough surfaces they like to climb and hang on.

Even so, Hwang knows there's no guarantee any bats will move into the houses she's built—no matter how endangered they are. But she insists, "It's still important to make them. Putting up more habitats increases the chances that animals will be able to find a place to live and survive." It also shows people how architecture can be designed to include—not exclude—animals that are helpful for our environment. And, says Hwang, "make [humans] pay more attention" to the possibilities.

Great (Animal) Estates

Los Angeles-based architect and artist Fritz Haeg would also like people to pay attention—to dozens of kinds of animals. In 2008, he was commissioned by the Whitney Museum of Art in New York City to make his first "Animal Estates." These were habitats for animals that lived on the Whitney's site 400 years ago, when the land was marsh and tulip forest: bald eagles, northern flying squirrels, eastern tiger salamanders, and nine other species.

Haeg installed nest boxes, burrows, and houses made from gourds around the entrance to the museum. He hoped they would call attention to how the development of cities means a lot of animals can no longer live among us; they used to make their homes in and around trees, and when we cut down trees to put up our buildings, we destroyed their habitats.

Haeg says he wants his Animal Estates to show how, "With very simple means, we can accommodate those species again. And some of them we might really want to have around." (Like Dr. Hwang, he mentions insect eaters and pollinators.) He's since been commissioned to design Estates in eight other cities—for many different animals, depending on what's native to those locations. For example, his Estates for the industrial (and polluted) city of Rotterdam in the Netherlands includes a habitat for the Eurasian Skylark. Its population has decreased by 95 percent in the last 10 years.

Fritz Haeg's tactics are sort of the opposite of Joyce Hwang's. He designs houses that are basic and not concerned with looking lovely. He says, "I wanted to do handmade, modest structures that would get people thinking: What kinds of animals do I want to host on my land?" He hopes people will research what animals need homes where they live. Anyone can download one of his designs from the Internet and build it themselves. Says Haeg, "I want to capture people's imaginations and have them ask, 'Who else is this city for?' "

Planning Page

You may PLAN your writing for question 45 here if you wish, but do NOT write your final answer on this page. Writing on this Planning Page will NOT count toward your final score. Write your final answer on Pages 13 and 14.

45

Why does the author compare how people treat "pets" and "pests" in the article? How does the author develop ways that people are helping "pests" throughout the article? Use details from the article to support your response.

In your response, be sure to

- explain why the author compares how people treat "pets" and "pests" in the article
- explain how the author develops ways that people are helping "pests" throughout the article
- use details from the article to support your response

STOP

Directions

Read this story. Then answer questions 46 and 47.

In this excerpt, Paolo Levi is secretly learning to play the violin. Paolo's teacher, Benjamin, refuses to continue his violin lessons until the boy's parents are told about the lessons. Paolo's parents share a past friendship with Benjamin from when they were forced by their captors to play music during World War II.

Excerpt from *The Mozart Question*

by Michael Morpugo

"Will you come with me?" I begged him. "I can only do it if you come with me."

"If you like," he said, smiling.

"Benjamin carried Papa's violin for me that day and held my hand all the way back to the Dorsoduro. I dreaded having to make my confession. I knew how hurt they would be. All the way I rehearsed what I was going to say over and over again. Mama and Papa were upstairs in the kitchen when we came in. I introduced Benjamin and then, before anyone had a chance to say anything, before I lost my courage entirely, I launched at once into my prepared confession, how I hadn't really stolen Papa's violin, just borrowed it to get it mended and to practice on. But that's as far as I got. To my surprise, they were not looking angry. In fact, they weren't looking at me at all. They were just staring up at Benjamin as if quite unable to speak. Benjamin spoke before they did. "Your mama and papa and I, I think perhaps we do know one another," he said. "We played together once, did we not? Don't you remember me, Gino?"

"Benjamin?" As Papa started to his feet, the chair went over behind him.

"And if I am not much mistaken, Signora," Benjamin went on, looking now at Mama, "you must be little Laura Adler—all of us violins, all of us there, and all of us still here. It is like a miracle. It *is* a miracle."

What happened next I can see as if it were yesterday. It was suddenly as if I were not in the room at all. The three of them seemed to fill the kitchen, arms around each other, and crying openly, crying through their laughter. I stood there mystified, trying to piece together all I had heard, all that was going on before my eyes. Mama played the violin too! She had never told me that!

"You see, Paolo," said Benjamin, smiling down at me, "didn't I tell you once it was a wonderful world? Twenty years. It's been twenty years or more since I last saw your mama and papa. I had no idea they were still alive. I always hoped they survived, hoped they were together, these two young lovebirds, but I never believed it, not really."

Mama was drying her eyes on her apron. Papa was so overcome, he couldn't speak. They sat down then, hands joined around the table as if unwilling to let each other go for fear this reunion might turn out to be no more than a dream.

Benjamin was the first to recover. "Paolo was about to tell you something, I think," he said. "Weren't you, Paolo?" I told them everything then: how I'd gone for my lessons, how Benjamin had been the best teacher in all the world. I dared to look up only when I'd finished. Instead of the disapproval and disappointment I had expected, both Mama and Papa were simply glowing with joy and pride.

"Didn't I say Paolo would tell us, Papa?" she said. "Didn't I tell you we should trust him? You see, Paolo, I often take down my violin, just to touch it, to look at it. Papa doesn't like me to, but I do it all the same, because this violin is my oldest friend. Papa forgives me, because he knows I love this violin, that it is a part of me. You remember I showed it to you that day, Paolo? It wasn't long after that that it went missing, was it? I knew it had to be you. Then it came back, mended miraculously. And after school you were never home, and when you weren't home, the violin was always gone too. I told Papa, didn't I, Papa? I told him you'd tell us when you were ready. We put two and two together; we thought you might be practicing somewhere, but it never occurred to us that you were having lessons, nor that you had a teacher—and certainly not that your teacher was Benjamin Horowitz, who taught us and looked after us like a father all those years ago." She cried again then, her head on Papa's shoulder.

"But you told me it was Papa's violin, that he'd put it away and never wanted to play it again, ever," I said.

At this, the three of them looked at one another. I knew then that they all shared the same secret, and that without a word passing between them they were deciding whether they should reveal it, if this was the right moment to tell me. I often wondered later whether, if Benjamin had not come that day, they would ever have told me. As it was, they looked to Papa for the final decision, and it was he who invited me to the table to join them. I think I knew then, even before Papa began, that I was in some way part of their secret.

46 How does the reunion affect Paolo's parents and Benjamin? Use **two** details from the story to support your response.

47 What is a central theme of "Excerpt from *The Mozart Question*"? Use **two** details from the story to support your response.

Directions

Read this article. Then answer questions 48 and 49.

Leonardo da Vinci lived over 500 years ago and is considered one of the world's greatest artists and inventors. He studied art with Andrea del Verrocchio. Verrocchio's workshop was called a bottega, the Italian word for studio.

Excerpt from *Leonardo da Vinci: Renaissance Genius*

by Barbara O'Connor

Leonardo had only to look around him to see that there was much to learn from his new master. In the main room of the bottega, the young artist saw some of his new teacher's assistants painting huge wooden panels covered with a fine white plaster mixture called gesso. Other assistants were hammering metal into elaborate armor. He saw others cutting gems or carving ivory for finely crafted jewelry. The older apprentices tended the fiery kilns used to harden clay sculptures. They also tinted paper or ground stone into pigment to make colors for paint. The younger apprentices, like himself, swept the floors and cleaned brushes and mallets.

As the newest member of the bottega, Leonardo knew nothing about the art techniques he saw being practiced around him. But he had a sharp mind, an eager curiosity, and one of the finest teachers in Florence. In addition to his talent in painting and sculpting, Verrocchio was a skilled goldsmith, musician, and mathematician. He took an instant liking to his new apprentice. The master artist recognized Leonardo's eagerness to learn and was amused by his country ways and sometimes rebellious spirit.

Leonardo's days in the bottega were long and busy. He worked for twelve hours each day before retiring upstairs to sleep on the straw-covered floor. Like all new apprentices, he started his training by doing simple chores. He swept, cleaned, mixed paints, and ran errands. Soon, however, he began to learn the skills he would need to work his way up from apprentice to master craftsman. He made brushes from animal fur and pens from goose quills. From sprigs of grapevine, he prepared charcoal for drawing. He helped apply plaster to walls for murals called frescoes. He learned how to mix egg yolk with ground pigments to make a paint called tempera and how to prepare wax needed for sculpture. He even mastered the skills of goldsmithing and metalwork.

Leonardo began his apprenticeship at a time when art was changing dramatically. Before the Renaissance, paintings often looked flat and not very realistic. Most artists in the Middle Ages were not interested in painting lifelike humans or nature scenes. They were more focused on painting images in a way that would give their work a religious meaning. By the time Leonardo came to Verrocchio's bottega, art had become more lifelike. Verrocchio taught his artists to be precise, to paint and sculpt exactly what they saw. He provided plaster casts of hands, feet, legs, and torsos so Leonardo and the others could observe and draw them. He smeared fabric with clay to make it stiff and heavy, then arranged it in drapes for the artists to study and paint.

Verrocchio also taught his students to use a new technique called perspective. This technique allowed artists to make the background of a painting look farther away than the foreground. It also helped artists make objects and people appear three-dimensional. Verrocchio taught his pupils to use geometry, mathematics, and shading to create perspective in their work. Leonardo may not have been able to attend a university, but he was getting a fine education from his teacher.

But life in the bottega offered Leonardo more than just an education in art. Often, writers, scholars, and artists gathered in the workshop to exchange news or share ideas. They talked about music, books, science, and philosophy. Leonardo relished the intellectual atmosphere.

From his first days in the bottega, Leonardo showed both an ability to learn quickly and a natural talent in art. Eventually, he was allowed to transfer Verrocchio's drawings onto walls or wooden panels or to put down the first layers of paint on fresco. As Leonardo became more skilled, he took on more demanding jobs. It was common for more experienced apprentices to draw or paint small portions of the master's work. Verrocchio watched Leonardo's progress and eventually assigned him tasks that required more artistic skill, such as painting backgrounds or adding plants or other small objects to a painting.

48 In "Excerpt from *Leonardo da Vinci: Renaissance Genius*," why were Leonardo and the other apprentices required to complete chores like sweeping the floor and cleaning brushes? Use **two** details from the article to support your response.

49 How do lines 24 through 38 help to develop a central idea of "Excerpt from *Leonardo da Vinci: Renaissance Genius*"? Use **two** details from the article to support your response.

Directions

Read this article. Then answer questions 50 and 51.

Leonardo da Vinci, an Italian boy of fourteen, was trying to decide what profession to study. His father, Ser Piero, was unsure how to advise the boy until he looked at several of Leonardo's drawings.

Excerpt from *Leonardo da Vinci for Kids: His Life and Ideas*

by Janis Herbert

But when Ser Piero looked at the drawings his son carried in his knapsack, he knew what Leonardo should do. He put the drawings in a fold of his sleeve and carried them to the "bottega" (which is the Italian word for studio or workshop) of the famous artist Andrea del Verrocchio.

Verrocchio was the greatest sculptor of the time and the official sculptor of the powerful Medici family. He had a square face, dark curly hair, and a serious expression that showed that work was his life. His eyes missed nothing, and as he looked at Leonardo's drawings he knew that this young man would come to be an artist even greater than he was. Verrocchio's bottega on Via de Agnolo was as busy as the streets of Florence. His workshop received orders for paintings, sculpture, household decorations, armor, jewelry, and many other items.

Leonardo's eyes opened wide when he saw Verrocchio's studio for the first time. The doors were open to the street and the teeming life of the city spilled inside. Playing children and their dogs ran through the rooms. Sometimes a pig or a chicken wandered in! Maestro Verrocchio stood in the middle of all the activity, alert to everything that was going on and directing the work of his young apprentices. Brushes and mallets and chisels hung on the walls, along with the sketches and plans of works in progress. One young man was firing up a kiln. Others hammered armor and pounded stone to powder. Easels, workbenches, and models stood everywhere.

Leonardo's father and Verrocchio shook hands. Young Leonardo was now apprenticed to the great artist. He would be a "discepolo" (which is the Italian word for an apprentice) and would spend many years learning to be an artist under the direction of Verrocchio.

GO ON

Those years flew by. Leonardo grew up to be a handsome and strong young man. He worked long days and slept at night in the upstairs living quarters with the other apprentices. Maestro Verrocchio was kind but strict, and his apprentices worked very hard. For the first few months Leonardo did nothing but sweep the floor, clean paintbrushes, and listen to the talk of the other apprentices and craftsmen. He watched everything that was going on. And in Verrocchio's bottega, there was so much going on! The wealthy people of Florence would come in to have their portraits painted. They asked Verrocchio to make items of silver and gold, armor and coats of arms, statues, dishes, and furniture. Verrocchio and his apprentices even made bells for churches and cannons used to guard the town. This work was done by the older apprentices.

Leonardo cleaned and swept. Eventually he was given the daily task of grinding pigments to make paint. After he mastered each task he was given a harder one. He polished bronze statues. He learned how to make paintbrushes. He prepared wooden panels for painting. He longed for the day when he would be able to use these materials and not just prepare them for another artist. In the meantime he sketched whenever he had time.

One day Verrocchio received a very important commission. Florence's cathedral, Santa Maria del Fiore, was nearly finished after almost two hundred years of construction. The final touch needed was a great bronze globe to be placed on the top. It would be a challenge to create, for the globe was to be twenty feet across and weigh over two tons. And not only would it be difficult to make—Verrocchio and his apprentices also had to figure out a way to install it on the top of the cathedral! Leonardo learned there was more to art than holding a paintbrush. The artist had to cast the globe in bronze, develop architectural plans, and even design the cranes and pulleys needed to install it. For this commission, art and engineering went hand in hand. In the workshop the apprentices calculated and designed for months. Plans covered the walls. On the spring day when it was installed, the whole town turned out to watch.

50 Read this sentence from lines 44 and 45 of "Excerpt from *Leonardo da Vinci for Kids: His Life and Ideas*."

Leonardo learned there was more to art than holding a paintbrush.

What does the phrase "more to art than holding a paintbrush" mean? Use **two** details from the article to support your response.

Planning Page

You may PLAN your writing for question 51 here if you wish, but do NOT write your final answer on this page. Writing on this Planning Page will NOT count toward your final score. Write your final answer on Pages 13 and 14.

51

Both "Excerpt from *Leonardo da Vinci: Renaissance Genius*" and "Excerpt from *Leonardo da Vinci for Kids: His Life and Ideas*" describe Verrocchio's bottega. How are the descriptions different? Why was Verrocchio's bottega an important place for art and ideas in Florence? Use details from **both** articles to support your response.

In your response, be sure to

- explain how the descriptions of Verrocchio's bottega in "Excerpt from *Leonardo da Vinci: Renaissance Genius*" and "Excerpt from *Leonardo da Vinci for Kids: His Life and Ideas*" are different
- explain why Verrocchio's bottega was an important place for art and ideas in Florence
- use details from **both** articles to support your response

STOP