

Grade 6 Narrative Performance Task:

Robots

Task:

Your school's technology club is building a new website. The club sponsor is also your English teacher, and he has encouraged everyone to research a topic related to technology for an upcoming project. Since you saw a movie about robots recently, you want to know more about what real robots can do. During your research, you found three articles about robots.

After you review these sources, you will answer some questions about them. Briefly scan the sources and the three questions that follow. Then, go back and read the sources carefully so you will have the information you will need to answer the questions and complete your research.

In Part 1, you will answer questions about the reading passages. In Part 2, you will write an informational article using information you have read.

Directions for Beginning:

You will now review three sources. You can review these sources as often as you like.

Research Questions:

After reviewing the research sources, use the rest of the time in Part 1 to answer three questions about them. Your answers to these questions will be scored. Also, your answers will help you think about the information you have read and reviewed, which should help you write your informational article.

Answer the questions in the spaces below the items.

Sources for Performance Task:

Source #1

The following is an article about several robots and the jobs they perform.

Meet the Robots

by Lucas Langley

If you think of robots as a thing of the future, think again. Robots do many jobs today. They work in mines and on farms, they help doctors and save lives, and they even explore volcanoes. Here are some robots that are hard at work.

Gemini-Scout

Gemini-Scout is a remote-controlled robot that does search-and-rescue work in mines under the ground. The robot is less than two feet tall and has wheels, which enable it to go up and down stairs and make tight turns—it can even roll through water! Gemini may be small, but it is strong and can easily carry food, water, and other supplies. In real emergencies, Gemini can even drag an injured person to safety.

Wherever it goes, Gemini-Scout constantly collects information. For example, it tests the air for gases and then tells miners when the air is safe. The robot also has a thermal camera, a special camera that locates heat energy to produce images that help it find miners who are trapped underground.

Once the robot finds the trapped miners, the miners can use the robot's two-way radio to talk with the rescue team.

This robot was built to be easy to use because its remote control operates like a remote control used for many video games. If you've ever played a video game, you would probably know how to use Gemini- Scout.

Dante 2

Although Dante 2 isn't saving lives directly like Gemini-Scout, its job is just as interesting and important. Dante 2's job is to climb into volcanoes to gather information for scientists. Like a spider, this robot has eight legs, which can help it climb the steep walls of the volcano while secured with a rope. Dante 2 is also built to survive extreme heat. When a volcano is too dangerous for scientists to enter, Dante 2 goes instead.

Once in the volcano, Dante 2 looks for vents, or holes, in the crater. Then the robot collects information about the gases that come out of the vents. In the past, scientists could not learn as much about volcanoes, but Dante 2 is changing that. Now scientists can study a volcano up close while remaining at a safe distance.



Dante 2 (NASA)

Mr. Gower

At first glance, Mr. Gower looks like a small metal cabinet on wheels, but its job is just as important as Dante 2 and Gemini-Scout. Mr. Gower is a robot that moves throughout a hospital, helping doctors and nurses bring medicine to patients. The body of the robot is a stack of locked drawers that store medicine. Nurses and doctors can unlock the drawers and get the medicine they need for their patients.

Mr. Gower can be programmed to go anywhere in the hospital. It can ride elevators, steer through hallways, and even move around things that get in the way. The robot is so strong that it can pull 500 pounds. Mr. Gower is battery powered and, after charging for only two hours, the robot can deliver medicine for twelve hours without stopping.

Not only does it work long days, but Mr. Gower can talk. It has been programmed to say hundreds of phrases like “Calling elevator” or “Your delivery is here.” Mr. Gower reduces the amount of time doctors, pharmacists, and nurses spend walking around the hospital, allowing them to use their time to focus on other important tasks.

Agribots

Agribots may not save lives, but many farmers find them very useful. An agribot is a robot that picks fruit. It might pick beans, oranges, grapes, or apples. Agribots are not yet widely used, but farmers are very interested in what these robots can do. Because picking a strawberry is different than picking an apple, agribots come in all shapes and sizes. Some have giant arms that are towed behind trucks, while others are able to move around on their own. In Japan, there is a strawberry-picking robot that can sense the color of the berries. This helps the robot know when each berry is ripe.

At the Massachusetts Institute of Technology (MIT), scientists are working to grow cherry tomatoes with no human help at all! They have created a greenhouse full of plants that are cared for by small agribots. The agribots are like robot farmers. Every plant has sensors that tell the robots what the plant needs. If a plant is too dry, a robot will water it. When a robot senses that a tomato is ripe, it uses a mechanical arm to pick the tomato. Agribots may seem unusual now, but one day they may be common on farms.

No matter how large or small a robot’s job, one thing is for certain—robots are here to stay. Because robots are dependable and tireless, they are valuable tools, and as technology advances, they will be capable of doing increasingly complex jobs.

Sources used:

Dillow, C. (2011). Rescue robot just made for mine disasters. NBC News. Retrieved from http://futureoftech-discuss.nbcnews.com/_news/2011/08/19/7410172-rescue-robot-just-made-for-mine-disasters?lite.

Leary, W. E. (1994). Robot completes volcano exploration. *The New York Times*. Retrieved from <http://www.nytimes.com/1994/08/03/us/robot-completes-volcano-exploration.html>.

Bares, J.. & Whittaker, W. L. Dante II. Carnegie Mellon: The Robotics Institute. Retrieved from http://www.ri.cmu.edu/research_sub.html?menu_id=234

Rivers, C. & Boston. S. (2004). Robot delivers medications at shock trauma center. University of Maryland Medical Center. Retrieved from <http://umm.edu/news-and-events/news-releases/2004/robot-delivers-medications-at-shock-trauma-center>.

Fields of automation. (2009) *The Economist*. Retrieved from <http://www.economist.com/node/15048711> .

Image of Dante 2 by NASA. In the public domain. Retrieved from http://www.nasa.gov/images/content/260941main_photographers-03.jpg

Source #2

The following is an article about robots at play.

Robots That Play Well with Others

by Lisa Langston

About 50 years ago, the author Isaac Asimov wrote a story called *I, Robot*. The story is set in the future, when robots take care of children. The main character loves her robot babysitter, Robbie. Unlike the child's parents, Robbie always has time to play. Robbie and the child have adventures together; Robbie is an endless source of fun!

When the story was written, it was only a fantasy. Now it is close to coming true because today, robots can do all kinds of work. They assemble electronic gadgets, guide trains on tracks, and sort trash. Today's robots can play as well as work—robots sing, dance, and even play music. For example, a Japanese robot can play the piano with its two mechanical hands.

Many playful robots are made to copy animals, too. Some robots play the way animals play while other robots play with animals. For example, moviemakers have designed huge robotic apes and dinosaurs to be in movies, but these kinds of robots aren't made only for movies. Robot animals can live with you. You can buy a robot pet, such as a dog, a seal, or even a dinosaur. These robot pets have a lot in common with real pets. They want your attention and you can teach them tricks. There is even a new version of a robot pet that has fake fur so you can pet your robot just like you pet your dog or cat. There is one difference, though—you don't need to take them outside or feed them!

Other robots help people play with live animals. One company, I-Pet Companion, has made a robot that lets people play with kittens, but from a distance. When you log on to the Internet, you can control the robotic pet from far away. The robot is put in a room full of kittens, and it drags a piece of string for the kittens to chase. When it's your turn, you can control the robot to pull the string this way or that way while the kittens jump after the string as you push the controls.

Some robots even play all by themselves. College students in Oregon have created robots that can play hockey or shuffleboard on their own. All year, the students work hard to design the robots. Then, the robots play the game without anyone controlling them. They grab the puck, turn, twist and compete to score, and as part of the final test, the robots must push the puck to the goal without being told what to do.

Even though there are no robots quite like Robbie, today's robots can still offer hours of fun. Who knows, maybe robots in the future will make Asimov's fantasy into a reality.

Sources used:

Taylor, A. (2011). Robots at work and play. *The Atlantic*. Retrieved from <http://www.theatlantic.com/infocus/2011/04/robots-at-work-and-play/100052/#img06>.

Lerner, E. (2012). Robotic hockey teams face-off at Penn Engineering. Penn Current. Retrieved from <http://www.upenn.edu/pennnews/current/2012-01-26/latest-news/robotic-hockey-teams-faceoff-penn-engineering>.

Cole, G. (2011). Robots at play. *Carvallis Gazette-Times*. Retrieved from http://www.gazettetimes.com/news/local/robots-at-play/article_be8aab10-90dd-11e0-9473-001cc4c002e0.html.

Hornyak, T. (2010). Piano player bot tickles the ivories in Taiwan. CNET. Retrieved from http://news.cnet.com/8301-17938_105-20020139-1.html.

Kee, E. (2012). Smart fur might see more sentient robotic pets. Übergizmo Retrieved from <http://www.ubergizmo.com/2012/03/smart-fur-robo-bunny/>.

Source #3

Here is an article on self-driving cars from the National Public Radio website (NPR.com), published on February 17, 2012.

When the Car Is the Driver

by Steve Henn

This week the state of Nevada finalized new rules that will make it possible for robotic self-driving cars to receive their own special driving permits. It's not quite driver's licenses for robots—but it's close.

The other day I went for a spin in a robotic car. This car has an \$80,000 cone-shaped laser mounted on its roof. There are radars on the front, back, and sides. Detailed maps help it navigate.

Do people notice it's a self-driving car and gawk?

"We get a lot of thumbs up," says Anthony Levandowski, one of the leaders of Google's self-driving car project. "People drive by and then they wave. I wish they would keep their eyes on the road."

Levandowski is in the passenger seat with a laptop showing him what the car can see. Chris Urmson is behind the wheel. But his hands are in his lap and the steering

wheel is gently turning back and forth, tracing the contours of California's busy Highway 85.

"And it can adjust the speed. If there is a particularly tight corner, it will slow down for that," Urmson says. "It adjusts speed to stay out of blind spots of other vehicles. It tries to match speed with traffic."

Urmson has been working on this technology for close to a decade. His first car managed to travel just 11 miles on a dusty road. Google's vehicle is a giant leap forward.

"When we got this on the freeway and it was doing 70 miles an hour and just smoothly driving along the road, you could taste it—the technology," Urmson says.

"You could really feel the impact and how it's going to change people's lives. It was just amazing."

While he was talking, a motorcycle cut us off. The car saw the move coming, and we hardly even noticed.

Google's fleet of robotic cars has driven more than 200,000 miles over highways and city streets in California and Nevada. Google did this testing in kind of a legal limbo¹. These cars aren't forbidden, but, "There was no permission granted for any of that to happen by anybody," says Steve Jurvetson, a venture capitalist² and robotic car enthusiast.

"It's essential that there be a place to do tests," he says. "There's two ways to do it—the seek-forgiveness strategy and the seek-permission strategy. Frankly, the 200,000 hours I think that have been driven here in California—that's a seek-forgiveness strategy. Right?"

If anything [had gone] wrong, Google would have had a huge amount of explaining to do. So last year, the company hired a lobbyist³ in Nevada.

"The state of Nevada is close [to California], it's a lot easier to pass laws there than it is in California." Levandowski says.

He says Google convinced the state Legislature to pass a law making robotic cars explicitly legal. But the Legislature went further than just creating a place to test these cars—it ordered the Department of Motor Vehicles to create basically a driver's license for these robot cars.

"I thought it was great," says Bruce Breslow, director of the Nevada DMV. "My grandfather took me to the 1964 World's Fair in New York City many times. And they were promising me the car of the future as an 8-year-old, and I thought to myself, this finally could be it."

Starting March 1, companies will be able to apply to test self-driving cars on Nevada roads.

"The test vehicles will be Nevada's first red license plate since the 1940s," Breslow says. Think of it like a learner's permit—those bright red plates will let everyone know there's a student robot driver behind the wheel.

"And eventually when these vehicles are sold, it will be the first ever neon green license plate that the state of Nevada will ever issue—green meaning go, and the future's arrived," Breslow says.

Google says it will probably be years before cars like this go on sale. But Jurvetson, the venture capitalist, says he's convinced this technology could save thousands of lives "today, already, right now."

Robots are never distracted. They don't text or drink or get tired. They see things no human can.

"That front radar catches [a signal that] bounces off the ground," Jurvetson says. . . [Therefore] no human will ever have the amount of information that these cars have when they are driving."

While Nevada may be the first state to create a licensing system for self-driving cars, it won't be the last: Hawaii, Florida, and Oklahoma are already following suit. And Jurvetson says one day we may be asking ourselves if humans should still be allowed to drive.

¹ legal limbo: when the law isn't clear on a specific issue

² venture capitalist: businessperson who invests money into startup or small companies

³ lobbyist: a person who tries to influence laws or government policies made by government officials on behalf of a group or individual who hires them

Source used:

"When the Car is the Driver" by Steve Henn, from National Public Radio. Copyright © National Public Radio.

Part 1: ASSESSMENT ITEMS

1. Explain what Source #1 and Source #3 say about how robots are able to save lives by paraphrasing the information while avoiding plagiarism.
2. Many robots are designed to do normal tasks that improve people's lives or jobs. Provide **two** pieces of evidence from different sources that support this idea and explain how each example supports the idea. Cite evidence for each piece of information and identify the source title or number.

(Students will be provided with space to answer this question.)

3. Click on the boxes to show the claim(s) that each source supports. Some sources will have more than one box selected.

	Source #1: Meet the Robots	Source #2: Robots that Play Well with Others	Source #3: When the Car Is the Driver
Robots are more reliable because they don't get tired.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Robots could serve as a substitute pet when a person has an allergy to animals.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Robots often save time and energy.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part 2: Robots Narrative Performance Task

4. Student Directions

You will now review your notes and sources, and plan, draft, revise, and edit your writing. You may use your notes and refer to the sources. Now read your assignment and the information about how your writing will be scored; then begin your work.

Your Assignment:

Your technology club is ready to launch its website. Your English teacher is making the website into a class project. For your part in the project, you are assigned to write a story that is several paragraphs long about what happens when you get a robot of your own.

In your story, you have just received your new robot. You are excited to turn it on and see how it works. You press the button to turn on the robot. Write a story about what happens next. When writing your story, find ways to use information and details from the sources to improve your story. Make sure you develop your character(s), the setting, and the plot, using details, dialogue, and description where appropriate.

Narrative Story Scoring:

Your story will be scored using the following:

1. Organization/purpose: How effective was your plot, and did you maintain a logical sequence of events from beginning to end? How well did you establish and develop a setting, narrative, characters, and point of view? How well did you use a variety of transitions? How effective was your opening and closing for your audience and purpose?

2. Development/elaboration: How well did you develop your story using description, details, dialogue? How well did you use relevant details or information from the sources in your story?

3. Conventions: How well did you follow the rules of grammar usage, punctuation, capitalization, and spelling?

Now begin work on your story. Manage your time carefully so that you can

1. Plan your multi-paragraph story.
2. Write your multi-paragraph story.
3. Revise and edit the final draft of your multi-paragraph story.

For Part 2, you are being asked to write a story that is several paragraphs long, so please be as thorough as possible.

Remember to check your notes and your prewriting/planning as you write, and then revise and edit your story.

(Students will be provided with space to answer this question.)