ROBOTS & DRIVERLESS CARS

Segment Length: 6:20 minutes

Lesson Description:

Are robots and self-driving cars the way of the future? Will robots take people's jobs? Will we really be able to relax as the car does the work? Is that safe? Will there be any jobs left to go to anyway? This segment looks at the development, use, and impact of robots and self-driving cars.

Vocabulary:

Archaic—(adj.) antiquated; no longer appropriate for modern times

Concepts & Key Terms:

Creative Destruction—The process of disruptive innovation, where new technologies, products, or services cause the demise or destruction of established technologies, products, or services.

Objectives:

Students will be able to:

- discuss impending innovations of self-driving cars and robots.
- explain the benefits and drawbacks of self-driving cars and robots.
- evaluate the effects of technological innovations, such as self-driving cars and robots, on the way people live.

Preview Activity and Questions:

Have students answer the following questions in their notebooks:

Would you go for a ride in a self-driving car? Why/ Why not?

Use Think, Pair, Share to have students answer the preview question. After a few minutes, poll the students. Ask the students to discuss their answers.

Viewing Guide:

It is recommended that teachers show the video segment twice: once to allow students to view the video and focus on the issues presented, and once to allow them time to complete the viewing guide. After they complete the viewing guide, allow students a few minutes to work in pairs sharing and verifying answers.

Answers to Viewing Guide:

1. decisions
2. human error
3. regulators
4. rescue soldiers
5. innovation
6. ecosystem

Name _____ Date _____

Class _____ Period _____ Teacher _____

Robots & Driverless Cars Viewing Guide

Directions: As you watch the video, fill in the blanks with the correct words.

1. It takes time to get comfortable with having the car make _____.

2. Safety is the big reason we should welcome these cars. Ninety-four percent of people killed in car crashes are killed because of _____ _____.

3. But soon, if _____ allow it, technology will let us relax in our cars, and that could change our lives. It will save lives and create more relaxing commutes.

4. The military is making all kinds of robots. They call this one "the wildcat." These will soon deliver supplies or _____ _____. Some robots will be used to kill.

5. Whenever there's been _____, experts predict that employment will decline. But the experts can't imagine the new jobs.

6. Look back at horses and buggies. We saw the car displacing the horses, buggies, and buggy whips, but we don't lament that passage, do we? The blacksmiths of old probably had to figure out something else to do. They all found jobs. The economy evolves; it's an evolving _____.

Now, take a few moments to reflect on the video and answer the questions below:

In this video segment, we saw self-driving cars, robots that could be used by the military, and robots at work in hotels. In what other jobs could robots be used? _____

_____

_____

_____

_____

Should we be worried? Why / why not? _____

_____

_____

_____

Discussion and Analysis:

1. How are self-driving cars and robots creating and destroying at the same time? Is this concept, called creative destruction, new to the technological era in which we live? Explain.
2. Why would someone want to travel in a self-driving car?
3. Should businesses be allowed to produce self-driving cars? Should government let them? Should people be allowed to purchase and drive self-driving cars? Should government let them?
4. Just what is the role of government in all of this? What is the role of government, period?
5. Do you have faith in your own abilities to drive safely? What about other drivers? Do you have faith in them?
6. If self-driving cars reduce human error, wouldn't you be safer from other drivers' mistakes or bad driving?
7. While in the self-driving car, John Stossel used words such as scared and terrifying. What matters more, that you seem more safe or that you are more safe?
8. John Stossel said during the video that computers crash. They do. So what then? And what about hackers?
9. Will robots take many jobs from people? What kinds of jobs? What will happen to the people who lose their jobs?
10. Imagine military robots. How might they change the way countries act toward each other? How might robots change how countries fight wars?
11. With robot combatants, do you think countries would be more willing, less willing, or just as willing to fight wars?
12. Would you be bothered dealing with robots in hotels? What are the benefits? What are the drawbacks?
13. Do technological innovations cause some people to lose their jobs? What examples do you have? Do technological innovations help create jobs? What examples do you have?
14. Max Borders said in the video that "the economy evolves; it's an evolving ecosystem." What does he mean? Do you agree? What happens if we try to stop it from evolving?

Discuss These Lines from the Video:

1. New York's archaic laws forbid taking both hands off the wheel.
2. This is not natural but it does work. It drives itself and it's safer than me.
3. But soon, if regulators allow it, technology will let us relax in our cars, and that could change our lives. It will save lives and create more relaxing commutes.
4. I could imagine an ad saying "computers crash. You're going to trust your life to a machine?"
5. The military is making all kinds of robots. They call this one "the wildcat." These will soon deliver supplies or rescue soldiers. Some robots will be used to kill.

6. This dinosaur is a front desk clerk, chosen to appeal to kids. They have all types. Another robot stores your luggage for you. This one takes it to your room. And when you get there, there's no key. The door recognizes your face through facial recognition software.
7. Those savings will bring new opportunity. Don't believe it? Well, remember that 200 years ago, most Americans worked on farms.
8. A lot of people lost their jobs for a little bit of time, but then they found new jobs and they found jobs doing things that were more productive. And that's how our economy grows.
9. Look back at horses and buggies. We saw the car displacing the horses, buggies, and buggy whips, but we don't lament that passage, do we? The blacksmiths of old probably had to figure out something else to do.
10. The economy evolves; it's an evolving ecosystem.

Quotes for Discussion:

We are on the eve of innovations whose scope cannot be foreseen.

— Ludwig von Mises

We humans have a love-hate relationship with our technology. We love each new advance and we hate how fast our world is changing... The robots really embody that love-hate relationship we have with technology.

— Daniel H. Wilson

If you asked Americans back in the early 1900s their opinions about daily transportation needs, they'd have said they wanted faster horses that ate less food.

— Gary Shapiro

It'll be an order of magnitude safer than a person. In fact, in the distant future, I think [...] people may outlaw driving cars, because it's too dangerous. You can't have a person driving a two-ton death machine.

— Elon Musk

Seniors can keep their freedom even if they can't keep their car keys. And drunk and distracted driving? History.

— Chris Urmson

I think [autonomous driving]'s just going to become normal. Like an elevator. They used to have elevator operators, and then we developed some simple circuitry to have elevators just come to the floor that you're at, you just press the button.

— Elon Musk

After a lifetime of driving, repairing, and studying automobiles, I have come to an unavoidable conclusion – we are the weakest link in a car. As car components go, human beings are deeply substandard – we have imperfect perception, we are ruled by emotion, and we vary wildly in quality.

— Peter Cheney

Google is working on self-driving cars, and they seem to work. People are so bad at driving cars that computers don't have to be that good to be much better.

— Marc Andreessen

I like the word 'autopilot' more than I like the word 'self-driving.' 'Self-driving' sounds like it's going to do something you don't want it to do. 'Autopilot' is a good thing to have in planes, and we should have it in cars.

— Elon Musk

The self-driving car is coming. And right now, our best supply of organs come from car accidents... Once we have self-driving cars, we can actually reduce the number of accidents, but the next problem then would be organ replacement.

— Bre Pettis

If you look at it from just a pure economic basis, technology is replacing all of the jobs robots can do, and machinery is replacing the jobs that humans once held. If we don't train our children to imagine, to create, they're going to be unemployable.

— Erwin McManus

The job market of the future will consist of those jobs that robots cannot perform. Our blue-collar work is pattern recognition, making sense of what you see. Gardeners will still have jobs because every garden is different. The same goes for construction workers. The losers are white-collar workers, low-level accountants, brokers, and agents.

— Michio Kaku

Activities:

1. Have students complete the K-W-L chart graphic organizer (page 71).
2. Have students complete the PMI chart graphic organizer (page 72).
3. Have students complete the Exit Ticket (page 73).
4. Distribute individual quotes from the Quotes for Discussion section to pairs of students. Have the students discuss the meaning of the quote and write the meaning on the back. Have students present the quotes and their explanations or collect them as an exit ticket.
5. Show the class one of these bonus videos on the DVD: Economics Made the World Great, Elijah McCoy, or Hockey Stick of Human Prosperity. Ask the students to relate the bonus video to the Robots and Driverless Cars segment.
6. Read one of the articles in the Resources section. Then write a summary using Cornell (two-column) notes. (See link in the Resources section for help in taking Cornell notes.)
7. Research the efforts by car companies to produce self-driving cars. How much money are these companies investing in this effort? Why? Are any car companies not developing them? If so, why aren't they? Report your findings to the class in a slideshow. (See link in the Resources section for help in preparing a slideshow.)
8. What are the laws in your state regarding self-driving cars? Have those laws changed recently? Are there proposals to change them? Research and write an essay about this topic.
9. Are there any federal regulations regarding driverless cars? If so, what are they? What are the arguments for and against national regulations regarding self-driving cars rather than state regulations?
10. Research robots already in use in the military. What are they used for? What can they be used for? What robots are being developed for future use? Report your findings to the

class in a slideshow. (See link in the Resources section for help in preparing a slideshow.)

11. In groups, research arguments for and against self-driving cars or the use of robots in the military. Then, conduct a classroom debate. (See link in the Resources section for a guide to conducting classroom debates.)
12. Research and write an essay about the Australian Taxpayers Alliance, whose video mocking government protecting jobs by stifling technology appeared at the end of the Stossel video segment, Robots and Driverless Cars.
13. Watch one of the videos listed in the Resources section. Then, write an essay about the video.
14. Write a tweet, poem, or song about the benefits or drawbacks of robots, robots in the military, self-driving cars, or any related topic.
15. Produce a "man-on-the-street" video in which you ask people if they support the development and use of self-driving cars or the use of robots in the workforce. Be sure to ask them to explain their answers. (See links in the Resources section for help in producing man-on-the-street videos.)
16. Research and decide if you support or oppose self-driving cars or the use of robots in the military. Then write a persuasive essay arguing your position. (See links in the Resources section for help in writing persuasive essays.) As an alternative, write and deliver a speech to the class in which you try to persuade the other students to agree with your position. (See links in the Resources section for help in speaking to a class.)

Resources:

Guides

A good explanation of K-W-L, with a sample chart, and a chart for downloading:
http://www.readingquest.org/strat/kwl.html

Also helpful for K-W-L:
https://www.teachingchannel.org/videos/structured-learning-teaching-tip

Think, Pair, Share

A brief explanation of the Think, Pair, Share instructional strategy, with examples:
http://www.readingquest.org/strat/tps.html

A video explanation of Think, Pair, Share:
https://www.teachingchannel.org/videos/think-pair-share-lesson-idea

Conducting classroom debates:
http://712educators.about.com/cs/lessonsss/ht/htdebate.htm
http://www.edu.gov.mb.ca/k12/cur/socstud/frame_found_sr2/tns/tn-13.pdf
http://busyteacher.org/7245-conducting-class-debate-essential-tips.html

How to write a book report:
http://www.infoplease.com/homework/wsbookreporths.html

How to write a persuasive essay:
https://www.scribendi.com/advice/how_to_write_a_persuasive_essay.en.html
http://www.infoplease.com/homework/writingskills7.html

How to produce a man-on-the-street interview:

http://onemarketmedia.com/2009/02/16/seven-ideas-to-help-get-the-most-out-of-a-man-on-the-street-interview/

http://www.wikihow.com/Make-a-Man-on-the-Street-Interview

http://www.ehow.com/how_2283844_do-man-street-interviews.html

For a clear, simple explanation of the Cornell note-taking system:

http://coe.jmu.edu/learningtoolbox/cornellnotes.html

http://www.bucks.edu/~specpop/Cornl-ex.htm

For help in speaking to a class:

https://www.hamilton.edu/oralcommunication/tips-for-effective-delivery

Preparing effective slideshow presentations:

http://www.ehow.com/how_5032561_prepare-effective-powerpoint-presentation.html

http://www.microsoft.com/en-us/showcase/details.aspx?uuid=22f09a63-cecb-4260-a44f-8223d07dd031

http://blog.synapsiscreative.com/the-info/7-big-powerpoint-mistakes-you-just-cant-afford-to-make

Articles

"Are Robots Going to Steal Our Jobs?" by Ronald Bailey

http://reason.com/archives/2017/06/06/are-robots-going-to-steal-our

"Elon Musk Describes the Future of Self-Driving Cars" by Sean Hollister

http://gizmodo.com/elon-musk-describes-the-future-of-self-driving-cars-1692076449

"Elon Musk Is Wrong about Artificial Intelligence and the Precautionary Principle" by Ronald Bailey

http://reason.com/blog/2017/07/18/elon-musk-is-wrong-about-artificial-inte

"The hype over driverless cars: is it overdone?" by Nicholas Carr

http://fortune.com/2015/02/18/the-hype-over-driverless-cars-is-it-overdone/

"Let Driverless Car Innovators—Not Bureaucrats—Work Out Security, Privacy Issues" by Andrea O'Sullivan

http://reason.com/archives/2017/06/14/let-driverless-car-innovatorsnot-bureauc

"The Military Wants to Teach Robots Right From Wrong" by Patrick Tucker

https://www.theatlantic.com/technology/archive/2014/05/the-military-wants-to-teach-robots-right-from-wrong/370855/

"The Myth of Technological Unemployment" by Deirdre Nansen McCloskey

http://reason.com/archives/2017/07/11/the-myth-of-technological-unem

"Poll reveals fear of travel in self-driving cars" by Detroit Free Press staff

https://www.usatoday.com/story/money/cars/2017/03/08/poll-reveals-fear-travel-self-driving-cars/98881656/

"Robot cars won't retire crash-test dummies anytime soon" by The Insurance Institute for Highway Safety

http://www.iihs.org/iihs/sr/statusreport/article/51/8/1

"Safety Advocates Urge Congress to Go Slow on Driverless Cars" by Ryan Beene

https://www.bloomberg.com/news/articles/2017-06-27/auto-safety-monitors-urge-congress-to-go-slow-on-driverless-cars

"Robots don't get drunk or drowsy, so why hold up driverless cars?"
by Adam Thierer and Caleb Watney
http://thehill.com/blogs/pundits-blog/transportation/342070-robots-dont-get-drunk-or-drowsy-so-why-hold-up-driverless

"US Army Wants Robot Medics To Carry Wounded Soldiers Out Of Battle"
by Kelsey D. Atherton
http://www.popsci.com/army-wants-robot-medics

"'You're killing people': Elon Musk attacks critics of self-driving cars"
by Cara McGoogan
http://www.telegraph.co.uk/technology/2016/10/20/youre-killing-people-elon-musk-attacks-critics-of-self-driving-c/

"Why Self-Driving Cars Must Be Programmed to Kill" from MIT Technology Review
https://www.technologyreview.com/s/542626/why-self-driving-cars-must-be-programmed-to-kill/

Books

Driverless: Intelligent Cars and the Road Ahead by Hod Lipson and Melba Kurman

Driverless Cars: Trillions Are Up For Grabs by Chunka Mui

Hands Off: The Future of Self-Driving Cars by Science, and Transportation United States Senate Committee on Commerce (Author)

Life As A Passenger: How Driverless Cars Will Change the World by David Kerrigan

Mighty Military Robots by William N Stark

Military Robots by Barbara Alpert

Military Robots: Mapping the Moral Landscape (Military and Defence Ethics) by Jai Galliott

Self-Driving Cars: "The Mother of All AI Projects" by Dr. Lance B. Eliot

Self-Driving Cars by Katie Marsico

Singularity Rising: Surviving and Thriving in a Smarter, Richer, and More Dangerous World by James D. Miller

Still Unsafe At Any Speed: Enter: The Driverless Car by Mark Parsons

Videos

ALL Obsolete Industries Deserve The Taxi Bailout! (Australian Taxpayers Alliance)
https://www.youtube.com/watch?v=_tjZchYXMmA

Everyone's Space
http://izzit.org/products/detail.php?video=everyones_space

Inventing the Future
http://izzit.org/products/detail.php?video=inventing_the_future

Military Robots
https://www.youtube.com/watch?v=5FFkDV2NKEY

The Paradox of Progress
http://izzit.org/products/detail.php?video=paradox_of_progress

Name _____ Date _____

Class _____ Period _____ Teacher _____

Robots and Driverless Cars K-W-L Chart

Directions: Complete the **K** and **W** sections prior to watching the video. After you have seen the video, complete the **L** section and answer the two questions below the K-W-L chart.

K	W	L
What I know about robots and driverless cars:	What I want to know about robots and driverless cars:	What I've learned about robots and driverless cars:

After watching the video and discussing it in class, are you more excited about the use of robots and driverless cars or more scared? _____ Why? _____

_____

_____

_____

Name _____ Date _____

Class _____ Period _____ Teacher _____

Robots and Driverless Cars PMI Chart

P = Plus: What are some positive effects of robots and driverless cars?
M = Minus: What are some negative effects of robots and driverless cars?
I = Interesting: What are some interesting aspects of robots and driverless cars?

+ Plusses +	- Minuses -	I

Will robots and driverless cars do more harm than good?_____

Explain: _____

_____

_____

_____

Name _____

Admit One

Why do some people oppose technological innovations?

_____

_____

_____

What I think:

_____

_____

_____

Admit One

EXIT TICKET

Name _____

Admit One

Why do some people oppose technological innovations?

_____

_____

_____

What I think:

_____

_____

_____

Admit One

EXIT TICKET

Name _____

Admit One

Why do some people oppose technological innovations?

_____

_____

_____

What I think:

_____

_____

_____

Admit One

EXIT TICKET