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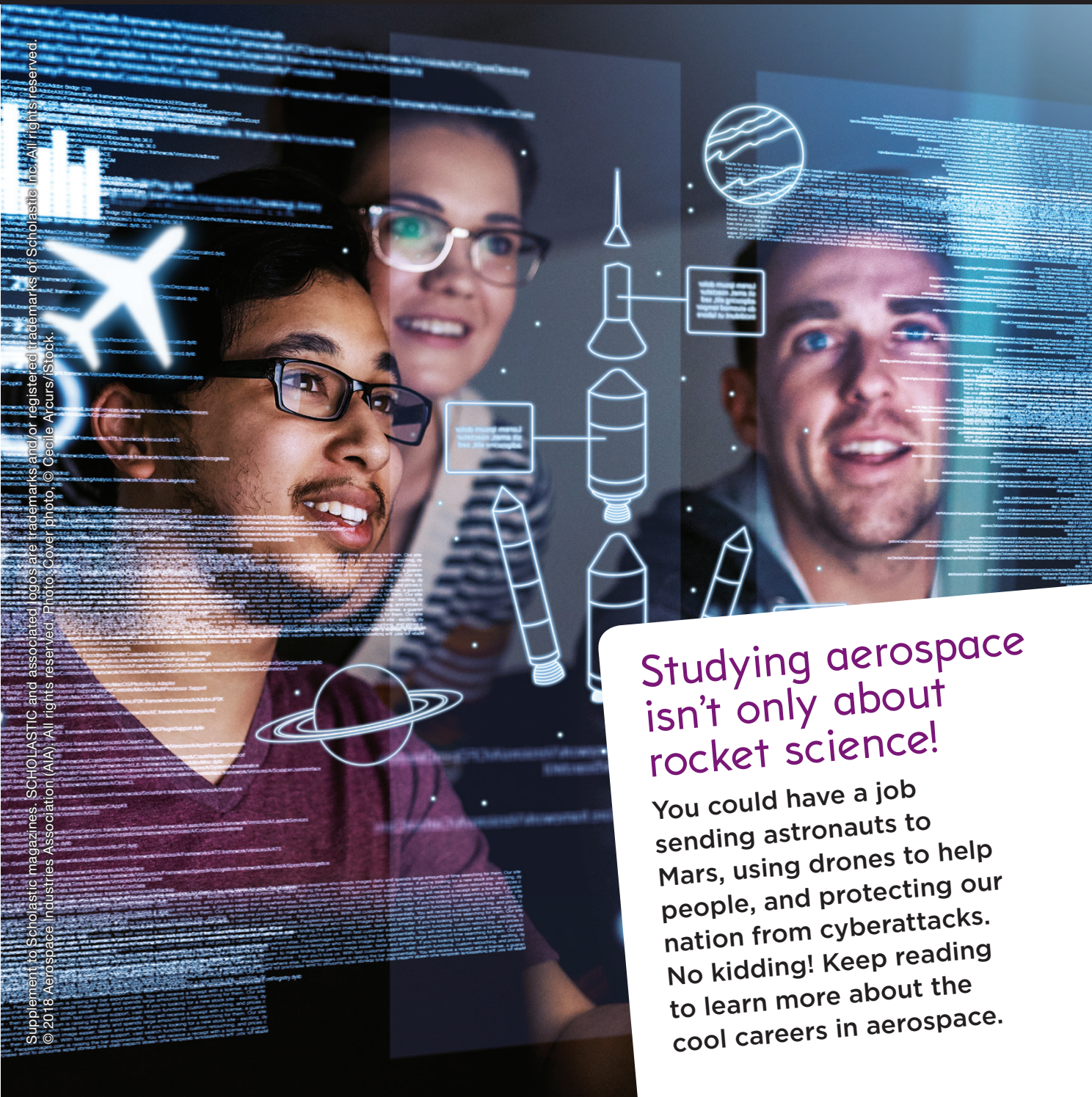
Out-Of-This-World Aerospace Careers

Studying aerospace isn't only about rocket science!

You could have a job sending astronauts to Mars, using drones to help people, and protecting our nation from cyberattacks. No kidding! Keep reading to learn more about the cool careers in aerospace.

CYBER GUARDIAN

If you've ever used a password to sign into a website or use social media, you've encountered cybersecurity, which is what keeps the Internet safe. Some of those safety features are created by the aerospace industry, which designs, builds, and operates airplanes, spacecraft, and other machines used in flight—and also works to keep vital aviation and space systems secure as well.

Imagine that your computer got a virus and all your assignments were deleted! That would be bad, right? Now imagine that an airline's computer system was hacked and people's flight reservations were cancelled. That would be even worse, and that is one of the things aerospace professionals are working to prevent.

Shirali Patel is a cybersecurity engineer at Raytheon, a company that develops solutions to make the Internet safe. Her team learns about different cyberattacks, threats, and malware (harmful software, such as viruses) that can damage digital infrastructure (mobile communications, satellite communications, and cloud computing), which can put our country at risk. Studying cyber threats helps aerospace engineers build better protective systems that keep information safe and catch cyber criminals!

The aerospace profession also provides people with the opportunity to work on jets, drones, satellites and spacecraft, and even miniature robots. What common elements do projects like these have? More than you might think. They all use **artificial intelligence** (AI), which is special programming that allows computers to perform tasks that were once unique to humans, such as seeing,

learning, and making decisions.

You may find AI in unexpected places. Have you ever been stuck in an airport for hours because your flight was delayed? Aerospace engineers are working to prevent that. By using AI to shorten the amount of time needed for planes to prepare for flight, these engineers are making airports more efficient and reducing delays in all flights.

Guess who will be building the AI of tomorrow? Young people in middle school math and science classes around the world are preparing to be tomorrow's aerospace professionals. But these jobs are about so much more than technical skills. Shirali Patel, the cybersecurity engineer, says that the most important skills in the workplace are the three C's: **communication** (translating thoughts into clear speech), **collaboration** (working as a team), and **critical thinking** (being able to work through problems and come up with unique solutions). These skills will help you become one of the aerospace leaders of tomorrow (but don't forget to do your algebra homework, too).

Is your TV listening?

The Internet of Things is communication that occurs when sensors in a machine perceive information (temperature changes, for example) and share it with other "smart" machines (like your TV, air conditioner, light switches, etc.) to make adjustments. Keeping the Internet of Things safe is a big task in cybersecurity.

For example, "smart speakers" use a microphone to detect voice commands (like "turn off the lights"). What if hackers could turn on smart speakers remotely? Whatever the microphone heard could be shared with someone else, and private information could be leaked outside your home. "We're all facing increased vulnerability due to the rapidly expanding Internet of Things," says Raytheon Chairman and CEO Dr. Thomas Kennedy, chairman of the Aerospace Industries Association (AIA). As an organization that advocates for policies to keep the aerospace and defense industries innovative and safe, the AIA and aerospace companies are constantly working to make sure the Internet of Things is as safe as possible.

If you had a machine at home that could respond to your questions, how could you use it to improve your life?

Why Humans Are Still Smarter

Aerospace machines that use artificial intelligence (AI) can think faster than you. They can think and work faster than all humans, and that's one of the biggest benefits of using them. But there are also things they can't do as well as humans yet. (Whew!) Machines that use AI don't have emotions and empathy, which can lead them to make decisions that a human might not have made. AI researchers are already working on making machines that can "feel" emotions and process information more like humans. This research will help create an effective balance in the future where machines and people can combine their skills to work faster and make the best possible decisions.

WHAT DO YOU THINK?

Now that you've learned about some new ways the aerospace industry interacts with your world, consider these questions with your classmates.

☆ What are some potential consequences of an unprotected Internet?

☆ What benefits will people gain if aerospace engineers help reduce flight delays?

☆ How might the three C's help a team of cybersecurity engineers face a problem such as tracking a cyber criminal?

Q & A With Aerospace Professionals
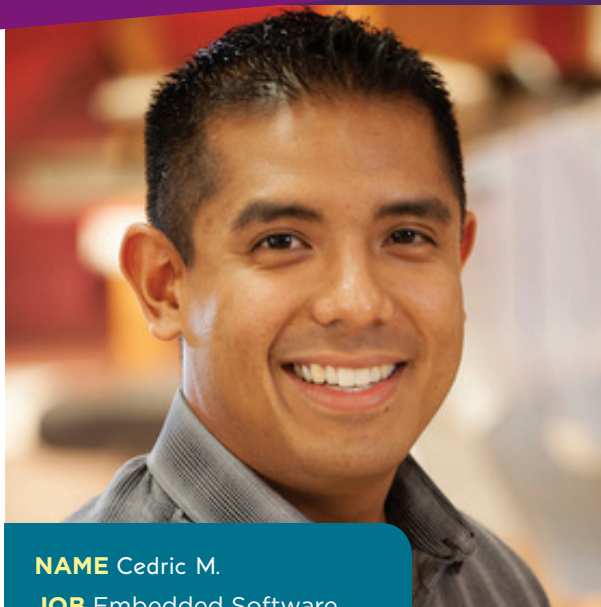
NAME Cedric M.
JOB Embedded Software Engineer
COMPANY Raytheon

NAME Stephanie W.
JOB Airplane Jet Engine Performance Engineer
COMPANY Rolls-Royce

What does Embedded Software Engineer actually mean?

I write many lines of software code to program microprocessors that do complex computations and make decisions to achieve specific tasks. You can think of a microprocessor as your brain and the software as the knowledge that your brain holds. Software is basically a set of instructions that tells a system how to make decisions and behave.

What inspired you to join the aerospace field?

As a child, one of my favorite things to do was to take apart my broken battery-operated toys so I could figure out how they worked and try to fix them. When I took my first flight on an airplane, I was fascinated by how something so big could move so fast and fly through the air.

What advice would you give to someone thinking about entering the aerospace industry?

If you like science, technology, engineering, and math (STEM), the aerospace industry is full of challenging problems waiting for talented students like yourselves to solve.

What does being an Airplane Jet Engine Performance Engineer actually mean?

I am responsible for figuring out how the different parts of the engine work together to deliver performance. Engine performance includes the thrust and power produced for the airplane, how fast the engine spins, and the temperatures within the engine, which would melt any metal without our superefficient cooling inside the engine.

What is your favorite thing about your work?

I love working as part of a team with members all over the world.

What advice would you give to someone thinking about entering the aerospace industry?

Building strong teamwork and communication skills is very important and can be practiced through middle school, high school, college, and as you start your career. Having a good foundation in science and math will help you with the problem-solving skills you need, and having a strong team-working foundation will prepare you well for a career in the aerospace industry.

Check out **scholastic.com/aeroprofiles** to learn more about these and other aerospace engineers.