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SIGNAL kids

AFCEA's STEM PUBLICATION

SCIENCE & TECHNOLOGY

INNOVATING FOR A SAFER WORLD

In this issue

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EDITOR: Rachel Lilly

STAFF: Chris D'Elia, Cyndy Hogan, Courtney Benedetto, Lydia Antonio-Vila

CONTRIBUTING EDITOR: Megan Lee

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CYBERSECURITY:
KEEPING THE DIGITAL WORLD SAFE!

Did you know there's a whole other world out there that you can't see—but you use it every day? It's the *digital world*, and just like the real world, it needs to be kept safe. That's where **cybersecurity** comes in!

Cybersecurity is all about protecting computers, phones and everything connected to the internet. You might not realize it, but cybersecurity helps protect a LOT more than just games or social media. It keeps your school's computers safe, protects your parents' bank accounts and even helps defend entire cities from cyber attacks!

Here are some helpful words to know:

- **Cybersecurity** is like a shield for computers, tablets and phones. It helps protect them from bad guys on the internet who try to steal information or cause trouble.
- **Phishing** (sounds like "fishing") is when someone tries to trick you into giving them personal information, like your password or address.
- A **virus** in a computer is like a cold for your device. It sneaks in and can make your computer slow, delete files or mess things up.
- A **firewall** is like a security guard for your computer. It stands at the gate and watches what comes in and out. If something looks dangerous or weird, the firewall blocks it, keeping your device safe from harm.

Without cybersecurity, people could steal passwords, mess with websites or try to hack into important systems. So next time you go online, remember—cybersecurity is working behind the scenes to keep the digital world (and you!) safe. Learning about cybersecurity is a great place to start.

WORD SEARCH

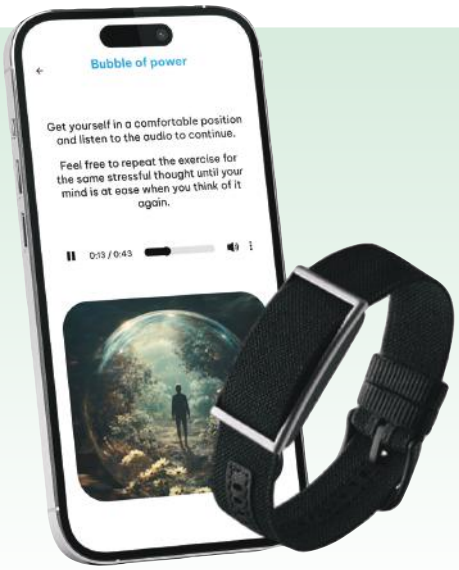
P	C	P	R	I	V	A	C	Y	L	
N	H	O	A	K	S	P	S	S	O	
F	M	I	M	S	V	S	A	A	G	
H	I	W	S	P	S	I	F	F	I	
S	A	R	E	H	U	W	R	E	N	
E	B	C	E	B	I	T	O	U	Z	
C	D	C	K	W	S	N	E	R	S	
U	A	O	J	E	A	I	G	R	D	
R	T	D	O	Y	R	L	T	A	W	
E	A	E	R	K	V	D	L	E	V	

Password
Firewall
Hacker
Login
Phishing
Virus
Computer
Secure
Privacy
Data
Safe
Website
Code

HOW TECHNOLOGY CAN HELP TRACK OUR MENTAL HEALTH

BY EMMELINE MANDEL (AGE 11) AND SAVANNAH DAVIS (AGE 11)

Our kid reporters Emmeline and Savannah got to chat with Farzad Ehsani, founder and chief executive officer of Innsightful, a company that makes a technology to track our mental health.



Who is Farzad Ehsani, and what does his technology do? Farzad is the creator of a smart device that you wear like a watch. It helps track mental health. In this article, we will talk more about him, why he created this watch and who it may be helpful for.

There are sensors underneath the watch that shine light onto your skin. The light hits your blood vessels and bounces back. The watch measures how roughly it bounces back. Other sensors measure how much you sweat and your body temperature. They use artificial intelligence (AI) tools to discover how much stress and anxiety a person has based on these things it measures.

Farzad had a personal loss in his life and wanted to help other people with similar issues, so he created this watch. It can be used by astronauts, soldiers in the military and doctors because these people have stressful jobs. It can also be used by other people, not just for work, but for them to track how much anxiety they might have in their everyday lives.

Farzad went to MIT (the Massachusetts Institute of Technology). Though he always thought he would do robotics when he was older, one of the things he studied in college was lizards' hearing. He said, "The way lizards hear is fascinating, and scientists still have not quite figured out how their ears work." He ended up with a degree in computer science. When asked about his college experience, Farzad said, "The important thing about college is learning how to learn." After college, he had a variety of experiences, like working in different countries on translation systems. That project took him to Japan.

He always had an interest in health care, along with helping people with their mental health. He also helped create technology to help people manage their diabetes. Other places he traveled for work include Australia, Taiwan, Mexico and all over Europe. He even met his wife in Australia while he was there for a conference! They have three kids ages 17, 21 and 23. Some things he enjoys outside of work are biking and dancing the tango.

When asked about his favorite part of his job, he said he has a love for data analysis and learning from data trends. He said, "Find something you like and get good at it." That's clearly what he has done, and that led him to create technology that could change the world.

ABOUT THE KID REPORTERS:

Emmeline and Savannah are in sixth grade at Stratford Landing Elementary School. They have been friends since kindergarten. They are also in the Advanced Academic Program. Savannah plays soccer, flag football and swimming. Emmeline does horseback riding, dance and gymnastics. Emmeline has a dog named Bean. He is a standard poodle. Savannah has a dog named Koda that is an Alaskan Malamute and Pitbull mix. They both have a sister and a brother.

TOP SECRET BRIEFING FOR YOUNG INNOVATORS

You've been chosen for a special mission: to use science and technology to make the world a safer place.

Which mission will you choose?

CYBER DEFENDER

Your mission is …
Protect computers, networks and important information.

Cyber defender jobs:
Cybersecurity analyst, ethical hacker, digital forensics investigator, military cyber specialist, data analyst, software engineer

TOOLS YOU'LL USE:

Network security monitoring tools can help protect connected devices, like computers, tablets and phones, to make sure they stay safe from hackers.

Encryption software protects data by scrambling text into a secret code.

Firewalls work like digital shields to block intruders.

Antivirus software to find malware (bad software programs that try to damage, steal or get access to a computer system, network or data).

EARTH PROTECTOR

Your mission is …
Use science and technology to keep people and the planet safe from harm.

Earth protector jobs:
Environmental scientist, wildlife biologist, meteorologist, disaster response planner, climate data analyst, renewable energy engineer

TOOLS YOU'LL USE:

Satellites and drones to track storms, wildfires or pollution.

Sensors that measure air quality, water safety or soil health.

Geographic Information Systems (GIS) with computer maps that help predict floods, earthquake or weather patterns.

Robotics and renewable tech like solar panels or wind turbines.

INNOVATIVE ENGINEER

Your mission is … Invent and build new technologies that make the world safer.

Innovative engineering jobs:
Aerospace engineer, biomedical engineer, robotics designer, civil engineer, mechanical engineer

TOOLS YOU'LL USE:

CAD software programs on the computer to design everything from bridges to rockets.

3D printers and prototyping tools to build and test new inventions quickly.

Robotics and sensors that can help explore space, perform surgery or respond to disasters.

Simulation technology to create virtual environments to test designs.

Folder illustration by Orapun-stock.adobe.com

QUIZ: WHICH SCIENCE & TECHNOLOGY HERO ARE YOU?

Answer these questions to discover your mission!

A huge storm knocks out power in your town. What do you do?

A) Protect the emergency computers so no hacker can sneak in.
B) Help test the water to make sure it's still clean.
C) Design new power lines that won't fall down next time.

Your team is exploring Mars. What's your first job?

A) Create a computer program to track new data from Mars.
B) Study the soil to see if plants could grow there.
C) Build a strong base where astronauts can live safely.

You're in charge of inventing a cool new gadget. What do you create?

A) A password-breaking robot to stop cyber villains
B) A solar-powered trash collector for the ocean
C) A super-strong helmet that protects explorers

An amusement park wants to add a brand-new ride. They ask YOU for help.

A) Create software that tracks data from sensors to stop rides before they become unsafe.
B) Suggest ways to make the ride run on clean energy.
C) Design better safety belts so riders stay secure.

Your school is hosting a science fair. What project excites you most?

A) A code-cracking game that teaches cybersecurity
B) A mini greenhouse that grows food faster
C) A tower made of paper that can survive an "earthquake test"

MISSION RESULTS

Mostly A's: CYBER DEFENDER

You're the ultimate codebreaker and computer protector. You stop cyber villains and keep missions safe online.

Mostly B's: EARTH PROTECTOR

You're a guardian of the planet. You find smart ways to keep nature, animals and people safe.

Mostly C's: INNOVATIVE ENGINEER

You're an inventor and builder of the future! You create new designs and technologies that protect people and improve the world.

This article was written and edited by humans, with a little extra brainpower from AI.

Secret Code Cipher

Do you like creating and solving puzzles? You might want to be a cryptographer! Cryptographers help keep important information safe by covering it up like a secret message. One way they do this is by coming up with a secret code with a cipher. You get to decide which letter of the alphabet matches which symbol you create. You can make your own cipher wheel at home!

MATERIALS:

- Construction paper
- Pen or Pencil
- Scissors
- Brass Fastener

INSTRUCTIONS:

1. Cut out one big circle and one smaller circle from the construction paper.

2. Along the edge of the smaller circle, write A through Z until it completes the circle.

3. Then get creative! Make up your own symbols, draw pictures, choose numbers or even the alphabet again to write along the edge of the bigger circle. Make sure that there are 26 symbols to match the 26 letters of the alphabet.

4. Poke a hole in the centers of both circles. Lay the smaller circle on top of the bigger one. Then take the brad and put it through both circles so the smaller circle can rotate inside the bigger one.

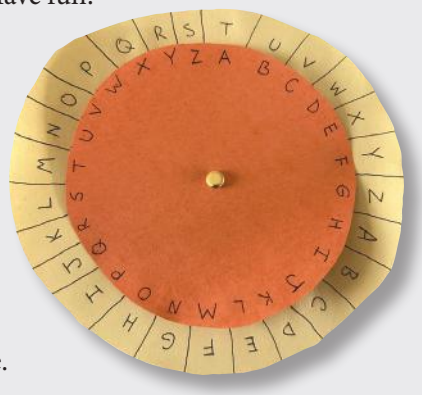
5. Decide which outer circle symbols or letters match which letters on the inner circle and let the secret message writing begin!

If you make these wheels with a friend, you can share messages in your own secret language. Have fun!

This is an example of a cipher. Can you use this to crack the code below?

The secret message is written with the outer circle's letters.

Write down the letters underneath to decode the message.



Secret message: **LVBXGVX KHVDL!**

Answer: SCIENCE ROCKS!

SOLDIERS' GADGETS AND GEAR

HELMET: Soldiers often have communication devices in their helmets so that they can speak with their units and commanders during missions.

GOGGLES: Night vision goggles help soldiers see at night so they can work undercover and see oncoming danger. Sometimes they even attach cameras to their goggles to share their surroundings with soldiers who aren't on the mission.

WEARABLE VEST: Some vests carry new technologies that can keep track of the soldier's health and alert people when they get hurt so they can get to safety faster. The vests can even sense if there is something harmful in the air.

ROBOT "PACK MULE" DOG: Robot dogs can also deliver supplies to soldiers, and they can travel to places that may not be safe for people.

DRONE: Drones keep soldiers safe by delivering supplies and keeping watch for dangerous areas.

RADIO AND GPS POCKET: Many vests have a pocket that holds a radio, GPS and first-aid supplies. That way, the soldier never feels lost or alone!

DRONE REMOTE: Some drones can do things on their own, but other times, soldiers will control them with remotes.

PANTS: The pants soldiers wear are made with special materials to keep them safe. They are heat-resistant, waterproof, lightweight and don't tear easily.

BOOTS: One technology that is still being worked on is a pair of soldier boots that can create power with every step! That way, the devices they carry won't run out of battery life.

illustratiion created with Adobe Stock images provided by sudowoodo (soldier), Zaleman (robot dog), Alena (drone) and Alwie99d (background).

THE SUN is a huge source of renewable energy. It helps create heat, light and electricity. But what happens when the sun goes down? Can we still use solar energy at night? The answer is yes! There are a few ways to store the sun's power overnight, and one can be found on your kitchen table.

SALT is more than just something to go on fries and pretzels; at high volumes and temperatures, it can store solar energy!

Between 302 and 662 degrees, salt turns into a liquid and is called molten salt. Some solar power plants collect sunlight through mirrors and direct the sun's energy into a tower filled with molten salt. This creates steam that powers the generators at the power plant. The salt gets so hot that even during the night, the molten salt holds heat and solar energy.

OZOBOTS BRING CODING FUN TO SCHOOL

Angie O'Leary, a teacher at Canton Intermediate School in Canton, Texas, wanted her students to explore coding in a fun and hands-on way. This spring, she applied for a grant from the Alamo AFCEA Education Foundation to help make that happen.

With the grant, she bought Ozobots—tiny robots that follow colored lines and respond to simple codes. Students used markers and patterns to program the bots and watch them move, turn and even race!

The classroom was full of excitement as students learned how coding works through play and creativity. Thanks to the grant, Angie's students got a chance to discover how fun STEM can be!

Learn more about the Alamo AFCEA Education Foundation: alamoafcea.org/page/EduFoundation

STEM Grants: Helping Kids Build the Future!

DID YOU KNOW that every year, schools and programs in the central Maryland area can apply for ***STEM Kickstarter Grants***? These grants are special funds that help bring exciting science, technology, engineering and math (STEM) projects to life. They give students the chance to explore new ideas, use cool technology and learn by doing!

The AFCEA Central Maryland Chapter is currently collecting applications for this year's STEM Kickstarter Grants, and they can't wait to see what amazing projects will be created.

In the past, the chapter has seen awesome projects come to life thanks to STEM grants, like:

- **Bee-Bots**—tiny robots shaped like bees that help kids learn coding basics.
- **VEX IQ Classroom Robotics**—where students design and build their own robots to solve challenges.
- **DASH Robots**—colorful bots that respond to coding commands.
- **InvenTABLE**—a carving kit that encourages kids to invent, design and build their own creations.

AFCEA Central Maryland STEM Kickstarter Grants give opportunities for kids to think big, solve problems and discover how much fun learning can be. Who knows? The next big invention might come from a student in central Maryland!

Learn more: centralmd.afceachapters.org

AI and the Air Force: How Technology Is Changing the World

BY EVELYNN JOSEPH, AGE 12

I'm totally into STEM, and I've always wondered how these subjects connect to the real world, especially since my grandpa and uncle were in the U.S. Air Force. I recently interviewed Mike McGinley, the outgoing president of the AFCEA Lexington-Concord Chapter in Massachusetts. Outside his AFCEA work, he is also an executive at Google and a senior officer in the U.S. Air Force Reserve (He works with Air Force tech!), and the interview was mind-blowing!

Mike showed me how artificial intelligence (AI) can help with creative stuff, not just science stuff. Mike said that kids need to understand the basics of math and science but also how to use that knowledge to come up with new ideas—things grown-ups haven't even thought of. It made me realize how much my generation can change the world.

One cool thing Mike told me about was the "OODA loop" to observe, orient, decide and act. The Air Force uses it to make quick decisions. AI is helping them make those decisions even faster. It can even help find the right people for jobs and help fighter pilots by controlling drones like robotic wingmen. It's not science fiction; it's happening now!

This interview showed me that STEM isn't just about solving problems; it's about imagining new things. Whether it's designing logos with AI or flying drones, there are so many opportunities! I can't wait to see what tech is around when I'm in medical school!

And speaking of AI, I got to try out an AI voice recorder for the interview. I wore it as a necklace, and when I pressed the start button, it recorded our discussion and even created a transcript, meeting minutes and action items. I still took my own notes just in case it didn't work, but it was really cool to see how I could use AI in this interview.

With a little creativity, the sky's the limit!

Learn more about AFCEA Lexington-Concord: afcealexcon.org

3... 2... 1... LAUNCH!

The AFCEA Rocky Mountain Chapter helped three Colorado Springs school districts celebrate Rocket Day! Three thousand fifth graders built and launched Estes Cosmic Ray Rockets in Colorado Springs, Colorado, the current home of the U.S. Space Force. Leading up to launch day, students engaged, explored, explained, elaborated and evaluated the science and engineering of rocketry.

Students got ready by exploring the history of rocket science. Fifth graders then learned about gravity, thrust, drag and lift while designing, testing and improving their own straw rockets. Guardians from the Space Force arrived to help with building and launching the Estes rockets. Students took their turns as reporters, data recorders, videographers, safety officers and flight path observers as they launched their rockets toward space.

The busy day finished with talks with Space Force and NASA about exciting careers like astronaut, aerospace engineer, astrophysicist, computer scientist, and media and communications. Are you ready to launch your dreams?

Learn more: afcearockymtn.org