

FEBRUARY 2026

SIGNAL kids

AFCEA's STEM PUBLICATION



CRACKING THE CODE
Inside the Intelligence Community

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INSIDE THE INTELLIGENCE COMMUNITY

The intelligence community (IC) is a group of people who collect and study information to help keep our country safe. They look at things happening around the world, like news, technology and events, and try to understand what it means. Then they share what they learn with leaders so they can make smart choices. It involves paying attention to clues, collecting information, solving puzzles and getting a clear picture of what is happening around the globe.

WEIRD BUT TRUE ANIMAL SPIES

Birds, bugs and small animals are everywhere, but people don't always notice them. They are sneaky and can go places people can't because of their size and speed. That's why animals make great spies! The Central Intelligence Agency (CIA), which is like the government's spy agency, has been inspired by animals for a long time.

UNDERSTANDING THE INTELLIGENCE CYCLE



BY HUDSON, FIFTH GRADE

An intelligence agency works to collect, analyze and disseminate information to make better and more calculated decisions for national security. Agencies do this through the intelligence cycle. The cycle goes through these steps: planning, collection, processing, analysis and finally dissemination.

Former Director of the National Geospatial-Intelligence Agency (NGA)

Robert Cardillo explained more about the intelligence cycle. He said, "The intelligence cycle should always start by asking yourself the question, 'What decision am I seeking to improve?'" Then the cycle starts with forming a new question or problem statement, followed by researching what is already known, which usually reveals gaps in knowledge. These gaps then become "collection targets," leading to a plan to start gathering new information through methods like imagery from

During the Cold War, the CIA sent pigeons with hidden cameras to take pictures of secret places. The CIA also made two robot catfish named Charlie and Charlene that collected water samples in different areas to detect if there was anything bad in the water. And in the early 2000s, the U.S. Navy trained dolphins to search seafloors for mines because of the dolphins' echolocation abilities.

In the 1970s, the CIA designed a listening device that looked like a dragonfly, called Insectohtopter, but it wasn't used during missions because it was hard to control in the wind. These are a bit gross! During the Vietnam War, the U.S. forces disguised transmitters as tiger poop so no one would notice the spy device. The CIA also hid things in dead rats covered in wormwood oil so both people

and cats wouldn't touch them. Ew!

The CIA wanted to attach listening devices to cats for spying on people in parks, but cats have minds of their own, and they didn't follow directions.

Not all animals make the best spies!

What animal do you think would make a good spy?

space, signals intelligence or sending a human spy.

Collected information is then analyzed. Cardillo also stated that new information is processed and put together with old information to form a new hypothesis, also known as an educated guess. The result of the cycle is shown to the decision-maker with the confidence levels (high, moderate or low) you believe that you have in the information based on the quality of the sourcing and collection. The remaining gaps after a report is produced drive the cycle to begin again. This shows how the intelligence cycle could be compared to a circle by how it restarts repeatedly.

When asked about how long one cycle takes, Cardillo said, "It depends on the nature of the question," but cycles usually fall within a window of 12 hours to 12 days, with 75-80% fitting within that range.

Cardillo also had advice for kids who want to be intelligence officers. "The core thing for being an intelligence officer is the desire to serve." He also said that you should not expect parades and that you will not be called out as the hero.

ABOUT THE KID REPORTER

Hudson is a student in the fifth grade. He has traveled to more than 25 countries on four continents. He enjoys playing baseball, rock climbing and reading about spies and wars.



THE DATA DETECTIVE

EXPLORING DATA COLLECTION WITH JENNIFER EWBANK

BY WILLIAM AND LUCA, AGE 9

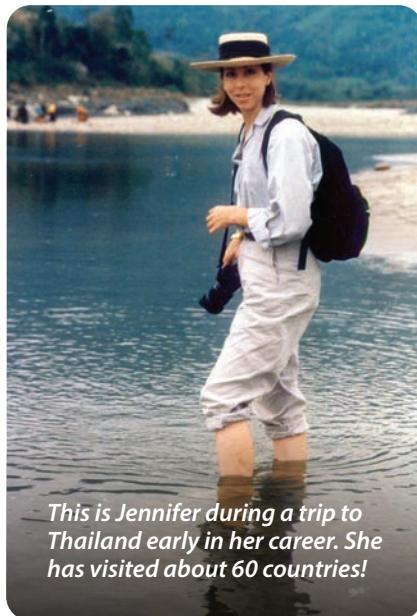
We were curious about how people use data to help the world, so we went on a mission to find out. That mission led us to Jennifer Ewbank.

Jennifer worked in intelligence as the deputy director of the CIA for Digital Innovation. That means she used data to help leaders understand what is happening in the world and make smart decisions.

People who work in intelligence ask big questions like: What is happening? Why is it happening? What might happen next? Just like Luca and me, they work together as a team, share ideas, compare information and double-check their answers.

Jennifer has traveled to about 60 countries. When we asked her which one she liked the most, she said Thailand. She told us about landing late at night and getting stuck in traffic. At first, she thought it was cars blocking the way. Then she saw an elephant walking down the road. We did not expect that.

Jennifer explained that data is everywhere. Data can come from computers, videos, writing, sounds and even things people post online. She said data is like puzzle pieces. When you put the right pieces together, that's when it can become intelligence.



This is Jennifer during a trip to Thailand early in her career. She has visited about 60 countries!

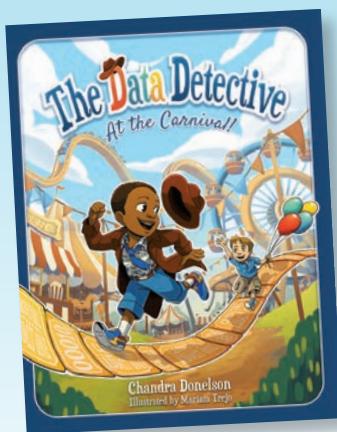
We asked Jennifer how kids can stay smart online. She said kids should always use social media with their parents' permission. She also said not everything online is true and that it is important to notice how posts make you feel.

When Jennifer was a kid, she dreamed of being an astronaut. That surprised us. She said that dream helped her love learning and science. Her job let her travel, learn new things and work on important missions.

Talking to Jennifer helped us realize something important. Intelligence professionals use a lot of data, but every mission starts with asking good questions, and we ask a lot of them.

ABOUT THE KID REPORTERS

William and Luca are both 9 years old and have been friends since they were 1 year old. William loves fishing, being outdoors and playing video games, and he wants to be a farmer when he grows up. Luca enjoys playing the piano, watching Formula 1 and figuring out how things work, and he hopes to be an inventor and pianist one day.



BOOK
CORNER

The Data Detective

Our kid reporters William and Luca inspired two characters in a children's book called "The Data Detective at the Carnival." In fact, William's mom, Chandra Donelson, wrote the book. Chandra is the chief data and artificial intelligence officer for the U.S. Space Force. In today's world, shaped by data and AI, kids are surrounded by information but don't always know how to make sense of it. The Data Detective series turns learning into an adventure by teaching kids ages 5-10 how to observe, think critically and solve real-world problems through stories they will actually love.

DON'T MISS THE NEXT ADVENTURE IN THE SERIES: "THE DATA DETECTIVE AT THE AIRPORT."

DATA TO DRIVE A NATIONAL ADVANTAGE

BY COOPER HOFSTETTER, AGE 13

The intelligence community (IC) was a topic I knew little about, and I got the chance to interview Gregory "Scott" Kirkpatrick, the director of science and technology for the Defense Intelligence Agency (DIA).

This interview helped me understand how the IC and the DIA collect data, steal information and use it for our nation's advantage.

The DIA's mission is to gather information on foreign countries to help us understand that country's capabilities. Kirkpatrick and his team collect information through sensors, satellites, open-source data and by stealing foreign countries' secrets.

The type of data you need to collect or steal really depends on what question you're trying to answer. For example, if you want to help policy makers, military leaders or commanders understand foreign weapon capabilities, you need to collect data on a foreign weapon, like a missile. You can collect how fast the missile flies, how far it goes and other useful information to understand the weapon's capabilities and program. If you don't have a sensor to track the missile, then you're going to need new technology, and the DIA can develop, design and deploy new sensors.

The DIA also gets data from open-source information like social media, websites, news reporting and online posts. It's estimated that a person like me produces 29.9 terabytes (TB) of data every day. That means I need 234 phones each day (like my 128 GB iPhone) to hold it all. I'll have phones for days!

I asked about artificial intelligence (AI) because you have to ask about AI these days. It helps keep track of all the data from sensing and open source. The IC has access to more data than ever, and he said, "It takes a machine to understand all this data and make sense of it."

Kirkpatrick's career in the IC started because he wanted to be in public service, like his family, who served in the Navy. As a kid, he wanted to end up like "Magnum PI," a TV show about a Navy officer who works in intelligence, lives in Hawaii and drives a Ferrari. Although Kirkpatrick famously said he's "still working on that Ferrari." In my opinion, Kirkpatrick is more like the guy who provides Ethan Hunt with his impossible missions. He described this as "collection management."

Kirkpatrick has traveled all over the world, like south of the equator to Africa, above the Arctic Circle in Norway, and he deployed to Kuwait for Operation Iraqi Freedom.

To be successful in the IC, you need good observation and reasoning skills, and most importantly, you need to be curious. Kirkpatrick opened my eyes to the DIA and the IC in general. It's so cool to know that people like James Bond exist in the real world (just with more planning and paperwork).



ABOUT THE KID REPORTER

Cooper Hofstetter is an eighth grader at DeLaura Middle School, Satellite Beach, Florida. He is passionate about history, video games and playing football with his friends.



GLITCH & GLOW-UP: MAKING SMART CHOICES ONLINE

It's important to be careful about the information we share online. Check out how "Glitch" and "Glow-Up" respond to the situations below and let us know what you would do!

1. The Personality Quiz Trap

GLITCH

Clicks on a viral quiz made by an unknown company overseas. It asks for their name, birthday, favorite places, political opinions and access to contacts. Glitch taps "Allow All" because "it's just for fun." Later, they wonder why weird, targeted ads start showing up everywhere.

GLOW-UP

Thinks: Why would a random company need all this info? Skips the quiz, blocks the site and adjusts privacy settings so apps can't access personal data without purpose. Who protected their data?

 **GLITCH**  **GLOW-UP**

Your move: _____

2. Location, Location ... Surveillance

GLITCH

Posts live stories from home, school, sports practice and favorite hangouts. All posts are publicly visible. A foreign data broker scrapes the posts, builds a profile on Glitch's daily routine and sells it to advertisers and unknown buyers.

GLOW-UP

Keeps location tagging off, only posts after leaving a place and uses private social accounts with limited followers. Who reduced their digital footprint?

 **GLITCH**  **GLOW-UP**

Your move: _____

Mapping It Out With Mark Munsell: How GEOINT Works

BY GRAHAM KEMPH, SEVENTH GRADE

Mark Munsell worked for 38 years at the National Geospatial-Intelligence Agency (NGA), holding roles from chief technology officer to chief artificial intelligence officer. Most of Mark's work was in the field of computer science. He has written over a million lines of code. Ultimately, much of the code Mark wrote helped automate his job. He used computers to help the NGA work smarter and more efficiently in the field of geospatial intelligence (GEOINT).

GEOINT is used by everyone today, whether you know it or not. It is used in creating digital maps based

on pictures. The pictures can be taken from satellites, drones, planes or really anything to show an area. It uses both pixel and vector data to locate items, targets and locations of key importance to the United States. Pixel data uses small colored dots that create an image, and vector data uses math equations, like points and lines, to make an image.

You don't have to work at the NGA to use GEOINT. It can be used daily to navigate your way to work or school or to spot landmarks. Within the NGA, it can be used to discover target locations and to identify or develop targets.

GEOINT uses processes and equations we learn about every day

in math and science. As Mark said, "Everything you are learning in school matters." In fact, he recommends every kid have two things in their room: a map of the world and a periodic table of elements.

It is clear from my time with Mark that he loves what he does. One of his favorite parts? Getting to go to a lot of places that other people do not. He fondly remembers his solo trip out to a lighthouse to gather data. He talked about how he fished from a rocking boat to pass the time as the technology gathered what he needed.

Artificial intelligence (AI) is making a big difference in GEOINT. AI can see things humans can't. For example, if there is a wide ocean and



1



2



3



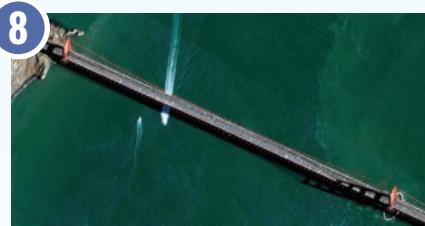
4



Have you ever wondered what the world looks like from space?

Get ready to see the world the way satellites see it. GEOINT, which stands for geospatial intelligence, uses imagery from high above Earth to help us discover and understand incredible places. In this activity, you will match each satellite picture to a famous landmark. Look closely for clues.

- 1. COLOSSEUM, ROME, ITALY
- 2. EIFFEL TOWER, PARIS, FRANCE
- 3. STATUE OF LIBERTY, NEW YORK
- 4. VEGAS SPHERE, LAS VEGAS
- 5. TAJ MAHAL, INDIA
- 6. SYDNEY OPERA HOUSE, AUSTRALIA
- 7. PYRAMIDS OF GIZA, EGYPT
- 8. GOLDEN GATE BRIDGE, SAN FRANCISCO





Crash Course on Intelligence Collection

BY COOPER HOFSTETTER, AGE 13

you are searching for boats, a human may spend hours looking through a fraction of the ocean and end up not seeing anything of note. AI may look through that same fraction and take little time to find something the human missed.

AI is not all sunshine and rainbows because it does have flaws. AI can mistakenly identify a play structure for a target. Because there is no human brain involved, AI looks at things objectively. This could lead to a major problem in intelligence gathering. Mark said the goal is to make AI faster and more accurate than humans, which may upset those who have spent their lives being trained in this field. Even then, Mark said understanding is key.

“The more you understand the technology behind AI, the better off you will be,” he said.

Mark retired from the NGA, but he isn’t sitting at home. He works daily with local business leaders, Congress members and the mayor to find ways to support the growth and development of his town, St. Louis, Missouri, a city with many factories and not as many people as it used to have. He uses his expertise to help grow his local economy. Mark shared that the same technology used to locate key targets can be used to pinpoint a dying plant and assist a farmer in saving his crop. His wealth of knowledge can support so many types of businesses, and he enjoys working with his local community to do so.

ABOUT THE KID REPORTER

Graham Kemph is a seventh-grade student who lives in Maryland with his parents and brother. He enjoys running and swimming, and he hopes to have a career someday in the field of engineering.

I learned the type of intelligence you need really depends on the question you are trying to answer. In addition to the DIA, I talked to people from the U.S. Air Force, National Geospatial-Intelligence Agency and National Security Agency to understand each one. Some intelligence disciplines are:

Human Intelligence (HUMINT): Collecting information from human sources—this data uses spies and other things.

Signals Intelligence (SIGINT): Collecting and analyzing intercepted signals and emissions—this data comes from communications, radars or other electronic sources.

Measurement and Signatures Intelligence (MASINT): Collects the inherent characteristics of the object or activity. This data helps you identify and understand the object based on science and physics.

Open-Source Intelligence (OSINT): Collects publicly available information gathering data from news reporting, social media, websites, geotags or other online posts. This data helps build baseline or maintain understanding.

Geospatial Systems Intelligence (GEOINT): Uses satellites or airborne platforms to collect images. This data helps monitor activities and changes.

Careers in the IC

There are so many different jobs in the intelligence community. Try to match each job title with the correct description.

Then you can decide which one interests you the most!

1. Collects information to create maps and reports that can help solve problems.
2. Watches out for threats from other countries and investigates anyone who is trying to steal our country's secrets.
3. Leads offensive and defensive cyber missions to protect the country from people trying to hack into computer systems.
4. Decodes and translates foreign messages to find and stop threats.
5. Decides what information needs to be collected and makes sure that the most important information gets shared to secure the nation.
6. Goes on top-secret and dangerous missions to gather information on enemies.
7. Investigates failures in technology to help make better tools to keep the country safe.
8. Manages agents in other countries who gather information from their country and share it with the United States.

Paramilitary Operations Officer

Collection Management Officer

Cyber Operations Officer

Geospatial Intelligence Analyst

Counterintelligence Agent

Forensic Engineer

Case Officer

Cryptologic Analyst

Answers: (1. Geospatial Intelligence Analyst) (2. Counterintelligence Agent) (3. Cyber Operations Officer) (4. Cryptologic Analyst) (5. Collection Management Officer) (6. Paramilitary Operations Officer) (7. Forensic Engineer) (8. Case Officer)

STEM HEROES: Q&A WITH A NAVY ENGINEER

What if your superpower was solving mysteries or finding hidden patterns? Real STEM heroes do this every day! We teamed up with Rohan, a U.S. Navy engineer in the intelligence field in San Diego, to discover his STEM superpowers.



LINK

Illustration by
Danielle Fabrega

ROHAN, NAVY ENGINEER

My STEM superpower: Using math to solve problems. It helps me develop innovative ideas and solutions.

What sparked my interest in STEM?

The non-player characters in video games, especially the bosses. I realized there was a pattern to their actions, and I had to figure out the pattern in order to defeat them.

The moment I realized I was good at STEM:

In the third grade, when I set the school record for completing my multiplication table.

Subjects or hobbies that helped grow my superpower:

Math, science, video games and playing sports (believe it or not, STEM principles can be visually seen through sports).

ADVICE FOR KIDS:

Anyone can be a scientist or engineer. The key is to never give up. STEM superpowers can start anywhere, and curiosity can grow into amazing skills. In San Diego, government teams use these skills every day to solve puzzles, use cool technology and help people. What you explore today could be the start of your own STEM superpower.

Learn more about AFCEA San Diego: sandiego.afceachapters.org

THE WINTER SOLSTICE SPIRAL

Students in Maryland explore the science behind the Winter Solstice!

Each year, as winter approaches and the days grow shorter, students at Crofton Woods Elementary School participate in a lesson called the Winter Solstice Spiral. While this tradition is rooted in reflection and mindfulness, it also connects to learning about science, technology, engineering and math (STEM).

Long ago, early civilizations noticed that the days were getting shorter and wondered why. Without modern science, people searched for answers by observing the sky and nature. They created stories and myths to explain the changing daylight and developed traditions to mark this important time of year. Many of these traditions celebrated the Winter Solstice, welcoming the return of longer days and the light coming back to the Earth.

The spiral is an ancient shape that appears throughout nature and science. Students learn that spirals can be found in snail shells, pinecones, hurricanes, galaxies and



even fingerprints. In math, spirals help us explore patterns, curves and sequences.

During the Winter Spiral activity, the classroom turns into a magical space full of light and nature. The teacher makes a big spiral on the floor using leaves and little lights. Students start by listening to stories about winter, then they take turns walking through the spiral. Each step

celebrates the return of light and the longer days that come after the winter solstice.

When the spiral is finished, it glows like a beautiful pattern everyone helped create. It shows how shapes and symmetry can be found in nature and in art. Students discover that STEM is not just about numbers and experiments. It is also about curiosity, caring and learning how the world works.

The AFCEA Central Maryland Chapter supports STEM education through its grants and scholarships. Learn more: centralmd.afceachapters.org