



U.S. ARMY



STEM@ Home

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Welcome to STEM@HOME!

The STEM@HOME Newsletter is intended to be a resource to provide engaging an educational activities that can be done with minimal materials and a whole lot of imagination.



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Welcome Back!!!
Join us for another year of amazing STEM@HOME



Math Corner

The first day of school was approaching, and Mrs. Sanders was busy getting her classroom ready for the year. On Monday, she worked 450 minutes. On Tuesday, she worked half the number of minutes she worked on Monday. On Wednesday, she only worked half the day which was 300 minutes. How many more minutes did she work on Wednesday than Tuesday?

Answer on Page 5



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STEM Highlights

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A Summer to Remember

During July and August, the C5ISR Center Community Outreach Office returned to Harford Glen Environmental Center for their Annual Math & Science Summer Camp! Each week, campers participated in various STEM related activities geared towards their grade-level. Each activity promoted STEM learning and encouraged the interest and engagement of many students.

Highlights of 5th & 6th Grade Week

Our 5th and 6th graders had a week filled with flight and rocketry. They learned about the properties of air, the four forces of flight, Bernoulli's principle, and different types of aviation technology. Students engaged in a demonstration from our special guest and NASA representative, Dr. Wollack. In addition, students formed small groups in an effort to use the engineering design process to build parachutes, model rockets, water bottle rockets, and a balloon rocket car. Their week culminated in a candy cane drop challenge, where campers tested their parachutes to see if their build would protect a candy cane when dropped from a two-story building. They were also able to launch their bottle rockets with support from Outreach Staff and our guest NCOs, SSG Jason Miller and SGT Christopher Miller.

Highlights of 7th & 8th Grade Week

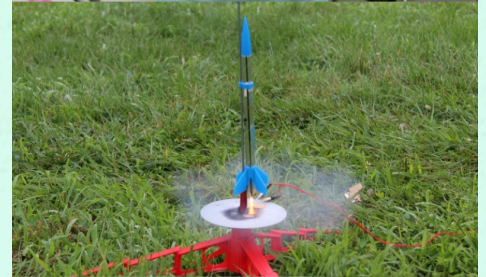
The 7th and 8th graders focused on STEM in pop culture. The hands-on nature of the activities had campers creating Rube Goldberg machines, attempting trick shots, and learning the basics of drumming. We had a special visitor at the beginning of the week – C5ISR Center Director Mr. Joseph Welch! He joined the camper's learning fractions by using drumsticks. Campers culminated the week with a full – camp Apollo-13 engineering challenge, inviting our C5ISR Center Assistant Chief of Human Resources Ms. Stephanie Batrony, and NCO visitors to work through the solutions as astronauts.

Highlights of 9th & 10th Grade Week

The 9th and 10th grade week focused on game theory. Campers learned about probability and statistics using dice, spinners, and cards, then moved on to probability versus possibility using well-know board games. Campers spent time playing and researching a variety of games before they put their knowledge to the test by creating a unique new card or board game, which were then placed on display for our NCO visitors to play.

To find out more about the C5ISR Center Community Outreach Program, visit:

https://c5isr.ccdc.army.mil/student_programs/



C5ISR Center Spotlight

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Mrs. Beth Ferry, SES



Job Title: Director, Engineering and Systems Integration Directorate, C5ISR

Education: Bachelor of Science, Chemical Engineering - University of Virginia. Master of Science, Systems Engineering and Technology Management - George Washington University.

1. What is your job and how does it support the U.S. Soldier?

My job is the Director of the Engineering and Systems Integration Directorate within the C5ISR Center at Aberdeen Proving Ground. The mission of my organization is to research, develop, and engineer capabilities to meet the US Army's operational needs in the area of C5ISR. This includes Command, Control, Communication, Computers, Cyber, Intelligence, Surveillance and Reconnaissance technologies. My organization provides new and innovative technical solutions like radios, computer interfaces and data, satellite technology, cyber defense and systems integration onto Army vehicles and aircraft that Soldiers use every day to complete their mission and return home safely.

2. What drew you to the STEM field originally?

I was always good at science and math, and I had great teachers and parents who encouraged me to work hard. I enjoyed figuring things out by doing and learning about how the world works. When I was young, I became involved with the local 4-H club that provided me the opportunity to try all different sorts of activities from crafts and sewing, to photography and baking, to rifle club and woodworking.

3. What is the most important STEM related innovation you've witnessed in your career?

Without a doubt, the most influential STEM innovation in the last 20 years is the cell phone. Convergence of the computer, phone and camera into a single device with access to data and information at our fingertips has fundamentally changed the way society interacts, conducts business, learns, and manages our daily lives. The children of today have a drastically different experience in social interactions and learning than those before them.

C5ISR Center Spotlight

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continued,

4. Why is STEM important to our national security and our national future?

Science, Technology, Engineering, and Math (STEM) is an important part of everyday life! Every time you solve a problem, you are using critical thinking and basic STEM principles. STEM is not exclusive: innovation requires divergent thinkers. Students can engage in STEM no matter what their interests or aptitudes – there is an element of STEM in every career and a place in STEM for everyone. STEM continues to be one of the fastest growing career paths in the country. It is critical to the future of our nation, its national defense, and the continued superiority of the U.S. Army. We need to provide our Soldiers with the best technologies and capabilities to help them continue to defend our freedom and come home safely.

5. What should students be engaging in to further their interests in a STEM field?

I would suggest that students just ask a lot of questions and be curious about the world around you. How does your car engine work? Why do the leaves turn in the fall? What makes the waves in the ocean? STEM is curiosity based and taking an interest in the world around you are all you need to be engaged. Also, say YES to every new experience! You might not think you enjoy STEM, but you should get involved in the community around you and try new things. There are many schools sponsored STEM-based activities and local clubs that are a great first look at STEM. Today, students are so lucky because almost everyone has access to the internet and the wealth of information at your fingertips! Find a topic that interests you and ask good questions.

STEM In The News

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The Future of Camouflage

Camouflage is one of the most fascinating physical adaptations in the animal kingdom. This characteristic, which is mostly held by cephalopods (animals with tentacles attached to the head) "occurs in organisms to protect themselves from predators.

Some predators also use this adaptive trait to avoid detection while stalking prey. This trait involves changes in the animal's color patterns to confuse the predator/prey." This remarkable natural phenomenon has fascinated scientists all over the world. Most recently, it has piqued the interest of Dr. Jinyao Tang and his research team from the Department of Chemistry at The University of Hong Kong (HKU). Dr. Tang and his team believe that they can replicate this color changing ability and apply it to other objects.

Dr. Jinyao and his team created an innovative, wavelength• selective intelligent colloid system that facilitates light-controlled multi dimensional phase segregation. In simpler terms, the team has found a way to recreate camouflage by altering bonded atoms which in turn reverses a change in color or shade. This very intensive process is known as morphing photochromic nanoclusters. "In mixing cyan, magenta, and yellow microbeads, Dr. Jinyao and his team are achieving photochromism on a macro scale. This macroscopic photochromism relies on light induced vertical phase stratification in the active microbeads mixture, resulting in the enrichment of colored microbeads corresponding to the incident spectrum" (The University of Hong Kong.)

This breakthrough by Dr. Jinyao and his team is huge because it sets society up for a future where camouflage could be seen outside the animal kingdom. Dr. Jinyao and his team also anticipate that by developing this new programmable photochromic ink, society will be able to utilize various applications such as e-ink, display ink, and eventually optical camouflage ink.

Resources:

Kong, The University of Hong. "The Future of Camouflage: Mimicking Cephalopods' Color-Changing Ability." SciTechDaily, 18 July 2023, [scitechdaily.com/the-future-of-camouflage-mimicking-cephalopods-color-changing-ability!](https://scitechdaily.com/the-future-of-camouflage-mimicking-cephalopods-color-changing-ability/).



Math Corner Answer:

The number of minutes she worked on Monday was 450.

To find the number of minutes she worked on Tuesday, divide 450 by 2. The quotient is 225.

Take the number of minutes she worked on Wednesday, which is 300 and subtract that from 225. The difference is 75.

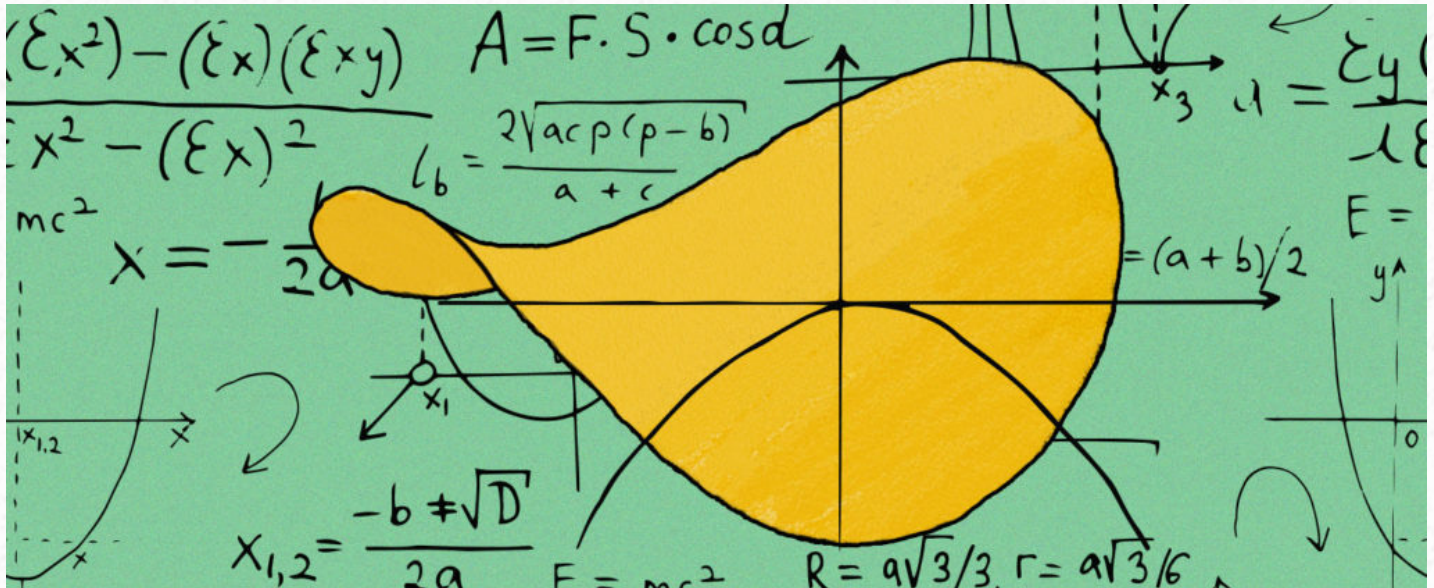
Answer: She worked 75 minutes more on Wednesday.

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STEM Challenge

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The Chip Ringle Challenge



Its BACK TO SCHOOL TIME! During this time of year, snacks such as granola bars, pretzels, and kid's yogurts seem to fly off grocery store shelves. One snack item that is popular amongst students is chips. Chips are a delectable snack that are easy to pack and good to eat. Recently young kids have been challenged to build difficult structures out of these salty snacks. Are you up for the challenge?

Mission: Can you build a ring using only chips? The Chip Ring is an engineering challenge where you create a ring using one large can of saddle shaped chip; no tape or glue is allowed. This challenge requires a lot of patience and focus, although the hardest part will be trying not to eat all your building materials.

Materials:

- One large can of saddle chips
- Paper towel (for your structure to stand on)
- Pencil and paper for (brainstorming)

Requirements: Only use saddle chip to build the structure, No tape or glue is allowed (the structure can be either big or small, as long as a ring/circle is made). Only use complete chips (no use any broken chips!), the structure must stand upright.

Design Process:

(Ask) What needs to be accomplished? Build a structure out of saddle chips by strategically placing the chip together.

(Plan) Draw out the base of your structure. Ask yourself; how will the base of your ring be able to support the top?

(CREATE) Begin your build using patience and strategy. Will you layer your chips in a certain pattern? if so, what is that pattern?

(IMPROVE) Adjust your ring, especially if it keeps breaking. Ask yourself what do you need to do differently? What other strategies will I try if my first design does not work as planned?

Questions to ask - What kind of structure would I have to make to achieve my goal? How can I construct the build in a way that won't easily break?

Fun Fact: There are over 100 flavors of Saddle Chips. These include Grilled chicken Wing, Blueberry & Hazelnut, Mayo Potato and Prawn Cocktail.

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STEM Activity

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The Unpoppable Bubble



Blowing bubbles is a simple and fun activity that anyone can partake in. While this activity often brings about laughter and fun one can't help but feel a little frustrated when one of them suddenly pops. What if there was a way to make bubbles last longer? Traditional soap mixtures that are used to create your classic bubble are made from simple ingredients; soapy water and another layer of soap.

In this activity, you will discover a different solution that will guarantee no busting of bubbles.

Material:

- 3 cups of water
- 1 cup Dawn dish soap
- ½ cup corn syrup
- bowl or empty bottle
- Saran wrap
- spoon for mixing
- microfiber gloves optional, straw, bubble wand or pipe cleaner

Directions:

Mix water, dish soap, and corn syrup in a bowl or empty bottle, cover with Saran wrap and place in the refrigerator for 24 hrs. Once time is up, place straw, bubble wand or bent pipe cleaners into the solution and blow.

Observe: How did the bubble look? How big was the bubble? Could you hold it? How long did it take before it popped?

Science explained:

Bubble solutions that you often find in stores are comprised of a simple solution where water is sandwiched between two layers of soap. This effect creates a soap film on the surface of the water. This is why your store-bought bubbles are so easy to pop. When the top layer of soap film encounters any surface, the water trapped in-between the soap layers evaporates causing the bubble to pop. In this experiment, you added a much thicker solution to the mixture, corn syrup. This syrup adds density to the soap layers, making them thicker and allowing the water to last longer in the bubble.

References: DIY Unpoppable Bubbles | Learning Resources,
www.learningresources.com/blog/diy-unpoppable-bubbles (Accessed 13 June 2023)

Fun Fact:

You can make frozen bubbles at any temp that is below freezing. The temp must be at least 9-12 degrees Fahrenheit.

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GET YOUR STEM ON

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Now is a great time to get involved in STEM.....

The C5ISR Center Educational Outreach Program is a collection of kindergarten through college-level programs designed to give students in the northeastern region of Maryland and Northern Virginia access to educational and extracurricular opportunities in the areas of science, technology, engineering and math, or STEM.

For more information about our STEM Outreach Programs, visit us at: https://c5isr.ccdc.army.mil/student_programs/

To reach our office, you can email us at: usarmy.apg.devcom-c5isr.mbx.outreach@army.mil

The Army Education Outreach Program (AEOP) CYBERMISSION registration is open for students, team advisors and volunteers! eCYBERMISSION is a web-based STEM competition that helps students in grades six to mine learn about real-life applications of STEM. Teams of three or four students are instructed to ask questions or define problems and then construct explanations or design solutions based on identified problems in their community. Learn more at

<https://www.usaeop.com/program/ecybermission/>



Thank You to our Volunteers

The C5ISR Center Community Outreach Office would like to take the time to thank our volunteers who supported our summer programs: RISE and the C5ISR Center Math and Science Summer Camp.

RISE Program Mentors

Ryan Lee
Teddy Sizemore
John (Jake) Galioto
Alexander (Alex) Canfield
Edwin Gee
Michelle Moore
Binu Parayil
Thomas Trinh
Sukki Chham
Chris Dubay
Nicholas Grayson
Jamell Jordan
Beverly Pepper
George Stiemly
Jared Snyder
Kyle Swisher
Eric Bosse

Robert Fischer
Saul Foresta
Jessica Hine
Jeremy Zwirn
Megan Duvall
Andrew Clifton
Liam Dobbins
Steven Huie
Jacob Kurth
Nicholas Perkins
Eric Rong
Myron (Jake) Schmidt
Calvin Duong
Robert Emmett
Matthew Limpert
Chris Mullen
Lissette Rodriguez-Cabanas

Ashley Ruth
Shailesh Shah
Brandon Walker
Minaam Ahmed
Stephen Badger
Travis Buffington
Nabil Hossain
Timothy Lukens
Brian Ma
Hay (John) Ma
Myles McVey
Glen Minko
Daniel Pacheco Nunez
Theodore (Ted) Pursche
Muhammad Saleem
Brendan Schafer

C5ISR Center Math and Science Summer Camp

Stephanie Batrony
SGT Christopher Miller
SFC Thomas Wittig
SGT Phillip Rosales
SGT Morgan Collett
SSG Mobolaji Ajayi
SSG Jason Miller

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