



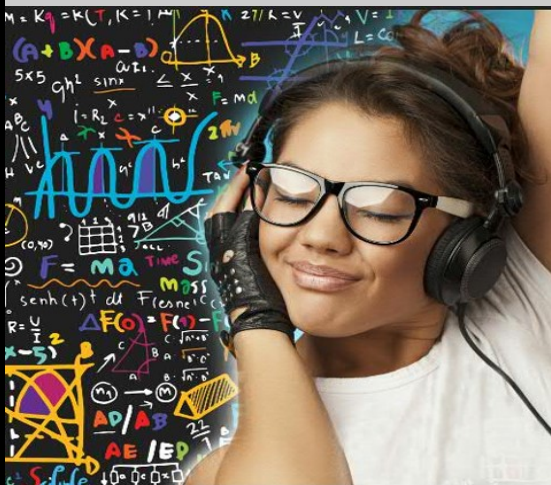
C5ISR CENTER STEM@Home

APPROVED FOR PUBLIC RELEASE

Welcome to STEM@Home!

As we maneuver the challenges of the COVID-19 epidemic, we strive to continue to make STEM accessible to all.

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



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VOL 2, Issue 7

Brain Teaser

WHICH TANK IS SAFE ?



Answer on Page 2



ARMY EDUCATIONAL OUTREACH PROGRAM

The Army Educational Outreach

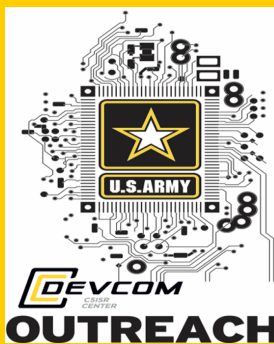
Program (AEOP) offers STEM programs for students at every level of their STEM Journey. From competitions, to enrichment activities—from apprenticeships to scholarships, AEOP has a program that is right for you.

WWW.USAEOP.COM

THE NEXT GENERATION OF INNOVATORS

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

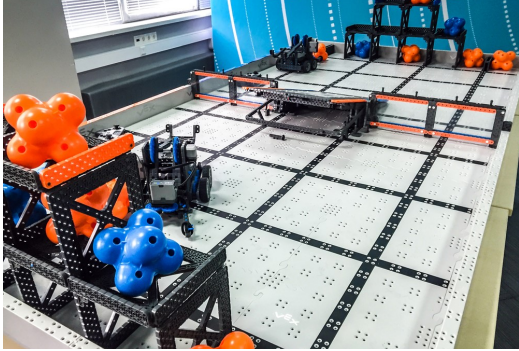
The C5ISR Center Educational Outreach Program is a collection of kindergarten through college-level programs designed to give students access to opportunities in the areas of science, technology, engineering, and math, or STEM.



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

STEM Highlight - Looking Back

Havre de Grace High School Students collaborate and compete in RoboRally



The Robotics Club at Havre de Grace High School held their first RoboRally competition earlier this year. The competition has courses created by the club members and is comprised of twelve rounds. Each round is allotted five minutes to complete the course with as little “faults” as possible.

Before the competition starts, the students have fifteen minutes to review the courses and plan their runs. In addition to this planning time, the students receive a demonstration of what a fault is – which is when their robot touches or crosses over the perimeter lines of the course.

After the planning, demonstrations, and explanation of rules, the students split into teams and begin the rally.

The students vary in grades, gender, and race, but they all share a love of STEM.

Josh K., a tenth grader, is in his second year with the club. He mentioned that he’s always been drawn to STEM subjects and wanted to learn about databases, coding, and the importance of robotics in everyday life.

“All of us are strong in math, in addition to our other STEM classes in school,” said Josh.

Jayden A., a ninth grader, commented that he’s been enjoying his first year with the club – especially the new experiences and knowledge of coding with the bots. He shared that math is one of his favorite subjects and that he wants to pursue a career as a software engineer. The next competition, a Tower Takeover challenge, will be held on March 31. The club’s last event will be a final VEX challenge, which will wrap up their school year in the middle of May.

Do you have what it takes to be a STEM leader of the Future?

AEOP Apprenticeships and Fellowships help you gain the skills and experience you need today to prepare for the STEM careers of tomorrow. Programs are available for students in high school and college as well as for enrolled in graduate and post-doctoral programs

The future is bright for careers in STEM. Make sure you have the skills you will need.

[Find out more at https://www.usaeop.com/apprenticeships-fellowships/](https://www.usaeop.com/apprenticeships-fellowships/)

Answer from Page 1: The lava that erupted a year ago – since the volcano erupted a year ago, the lava will be solid.

Resource: <https://www.riddlesnow.com/riddles/riddles-room-with-answers>

STEM Challenge

March Madness Challenge

March Madness takes place this year from March 13 to April 4 2022. The tournament, which closes out the college basketball season is one of biggest and most exciting tournaments that take place in college sports. The National College Athletic Division I Men's Basketball is a single elimination tournament of 68 teams that compete in seven rounds for the national championship. The tournament starts in Dayton, Ohio and will end in New Orleans, Louisiana with the Final Four.



Materials:

- Popsicle sticks
- Paper, cardstock, or cardboard
- Shoebox
- Newspaper
- Paper towel roll tubes
- Aluminum foil
- Small plastic cups
- String or rubber bands
- Small paper cups or bowls
- Pipe cleaners
- Straws
- Tape
- Glue
- Plastic spoons
- Water bottle
- Other useful items in your home

Testing Materials: Ping pong ball, bouncy ball, pom-pom

Mission:

In honor of the 81st March Madness tournament taking place, the Commissioners of Awesome College Sports has invited young engineers and sports enthusiasts to design a brand–new basketball hoop and shooter (catapult device). The Commissioners needs you to show both your plans and model so that they can choose the best final four designs.

Requirements:

- Must include both a standing basketball goal and throwing device.
- Bottom of backboard must be at least 6-8 inches from table or floor.
- Hoop or net must allow the ball to pass through easily.
- Throwing device must propel the ball through the air in order to make a basket.
- Throwing device must operate as the only mechanism throwing the ball.

Design Process:

ASK: What is the problem you need to solve? A new design for a standing basketball hoop and throwing device to enter the competition.

IMAGINE: Brainstorm and decide on one idea. How will your basketball and throwing device work?

PLAN: Draw a picture of your device. How will your throwing device and basketball hoop work?

CREATE: Use the materials to create a prototype of your basketball hoop and throwing device.

IMPROVE: How could you improve your basketball hoop and throwing device?

Questions to Ask: If you had more choices of materials, what would you use and why? What makes your basketball hoop and throwing device efficient and stand out from other designs?



SAFETY FIRST!

You Must Have Adult Supervision To Complete This Activity.



SHARE

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#C5ISRCenterSTEM

***You must have permission from your grownups before using social media.*

STEM in the News

Minecraft Used to Teach a College Course

Who among us hasn't heard of *Minecraft*?! To put it simply for those who haven't, *Minecraft* is a computer game where players can build anything. The game is described as an "online Lego" that involves building blocks and creating structures across different environments and terrains. Set in a virtual world, the game involves resource gathering, building, and crafting items.

Professors from Concordia University in Montreal, Canada have found a way to take *Minecraft* and use it as a game-based teaching method in their virtual classrooms. The world of *Minecraft* has provided these educators with a massive sandbox to play, experiment, and teach.

Published in the scientific journal *Gamevironments*, Professors Darren Wershler and Bart Simon describe how Wershler used *Minecraft* to teach a history class. The class was based entirely within the game, with instructions, assignments, in-class communication, and course work almost exclusively carried out within the *Minecraft* world and over the messaging app Discord.

"The course is not a video game studies course, and it is not a gamified version of a course on modernity," explains Wershler. "It's this other thing that sits in the middle and brushes up against both. The learning comes out of trying to think about those two things simultaneously."

The students adapted quickly to their unique classroom and new learning environment. Some students helped their classmates who were unfamiliar with the game, providing them with instructions on how to mine resources, build homes, plant food and survive zombies and skeletons. After listening to lectures and lessons, they worked on group projects in the game. One group recreated a famous building in Montreal named Habitat 67, which Wershler notes, fits right into the *Minecraft* aesthetic. Another group built an entire working city populated by *Minecraft* villagers on the model of the Nakagin Capsule Tower Building in Tokyo, Japan.

Rather than using the Creative mode that many educators prefer, the game was set in the more difficult Survival mode, so students were often confronted by looters and other enemies. The professors downloaded fan-made modifications to enhance the game as they chose, but those mods also made the gameplay wonkier and more liable to crash at inopportune times.

"It was important that the game remained a game and that while the students were working on their projects, there were all these things coming out of the wilderness to attack them," Wershler says. "This makes them think about the fact that what they are doing requires effort and that the possibility of failure is real."

He admits to being happily surprised with how well his students adapted to the parameters of the class he co-designed along with a dozen other researchers at Concordia. Wershler has been using *Minecraft* in his course since 2014, but he realized this approach created a scaffold for a new style of teaching.

"Educators at the high school, college and university levels can use these principles and tools to teach a whole variety of subjects within the game," he says. "There is no reason why we could not do this with architecture, design, engineering, computer science as well as history, cultural studies or sociology. There are countless ways to structure this to make it work."

Resource:

<https://www.concordia.ca/news/stories/2022/02/22/a-minecraft-build-can-be-used-to-teach-almost-any-subject-according-to-concordia-researchers.html?c=/news/media-relations>



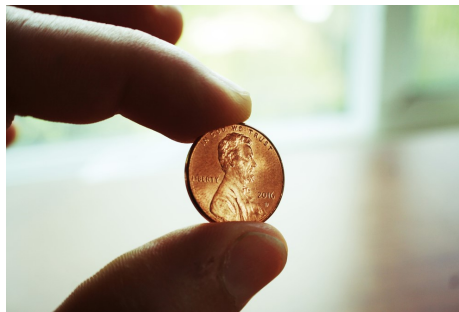
Fun Facts about Minecraft

- Minecraft is the highest selling video game of all time.
- The first version of the game was created in six days.
- "Ghasts" are voiced by a sleeping cat.

STEM Activity

Can you make a penny green experiment?

To celebrate the closing of the 2022 Beijing Winter Olympics, create your own fizzy Olympic rings to honor the hard work and dedication of the athletes from around the world who competed this month. The Olympic rings have five rings that are interlaced from left to right with the colors blue, yellow, black, green and red. The design is symbolic to represent the union of the five competing continents and the meeting of athletes from around the world at the Olympic Games. Using just a few ingredients from your kitchen you will can create a chemical reaction in the shape of the Olympic rings.



Materials:

- 3 small bowls with a flat base
- Paper towels
- Teaspoon
- 10 dirty/ old pennies
- ½ cup of white vinegar
- 2 teaspoons of salt
- Water

Directions:

1. To begin place about ¼ cup of vinegar in 2 of your small bowls. Then place about a teaspoon of salt in each bowl.
2. In your third bowl, pour 1/4 cup of water.
3. Take one of you pennies and dip it halfway and count to 10 into your vinegar and salt mixture. What did you notice?
4. Place about 5 pennies in each of your vinegar/ salt water bowls and allow them to sit for a few minutes.
5. Remove your pennies from one bowl and rinse them and let them dry on a paper towel.
6. Remove the pennies from your second bowl and place them directly on a paper towel. Make sure you do not rinse this group of pennies.
7. Wait a few moments, and observe what happens. Do you notice a difference between the rinsed and un-rinsed pennies? Do you now have either polished or green pennies?



SAFETY FIRST!

You Must Have Adult Supervision To Complete This Activity.

The Science Explained:

You should have noticed that half of your pennies were shiny and half were green. This is a result of a chemical reaction. Pennies are mostly made from copper just like the Statue of Liberty, which means they have the ability to oxidize like other metals.

In this experiment, when the pennies were dropped into the mixture, the vinegar which is an acid reacted with the salt to remove the top layer of copper oxide from the pennies. This is what makes the pennies shiny and is why you may have noticed when dipping the penny in the mixture that half of the penny started turning shiny. When the pennies are pulled out of the mixture, it causes the copper atoms to mix with the oxygen in the air and chlorine in the salt, which creates the blue green, substance you see known as malachite. If you wanted to speed this process up, you could have added more salt on the penny as soon as you laid it on the paper towel to dry.

Did You Know?

The Statue of Liberty used to be bright orange and shiny like a penny, but it is now covered in malachite as a result of the copper being exposed to salt, acid and water. Doing this experiment allowed you to see the chemical reaction that changed the Statue of Liberty in action.

Resource: <https://www.sciencefun.org/kidszone/experiments/dirty-pennies-kitchen-science-experiment/>