ARCS NEWS

Advancing Rural Computer Science

Brought to you by The Center for Educational Partnerships at Old Dominion University

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Announcements

Greetings, and welcome to our April Newsletter. We hope that wherever you live in the Commonwealth, you are seeing signs of spring!

We would like to take this opportunity to tell you about the K-5 Computer Science Integration Microcredentials that the ARCS team is developing in partnership with the ODU School of Continuing Education. The Microcredentials are best thought of as mini-courses. They will open on July 1, 2021 but will require pre-registration through an email you will receive this month. The Microcredentials are designed to be completed at your own pace, with some live help sessions planned for Algorithms and Programming. The Microcredentials complete the ARCS PD series. There are 5 Microcredential mini-courses in the stack:

1 Introduction to Computer Science, Digital Impact, and Digital Citizenship

2 Computing Systems, Networks and the Internet, and Cybersecurity

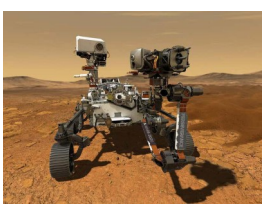
3 Algorithms and Programming

4 Data and Analysis

5 Lesson Integration

Each Microcredential mini-course will include a deep dive into the SOLs to help you develop strategies for integrating CS content into other, core subject areas. Depending on your familiarity with the Virginia CS SOLs, all 5 mini-courses will require up to 40 hours. Upon completion you will receive a $500 stipend, a certificate, and a digital badge. If you have any questions, please email us at TCEP@odu.edu.

Concept Corner



With the $2.7 billion one-way ticket to Mars, one would think the Perseverance Rover would have a modern computing system with a fast CPU. One would be wrong - partly, that is.

Those who experienced the late 90s will recall the curvy, colorful, see-through Apple iMac G3 released in 1998. It arguably saved Apple from bankruptcy; today, Apple is valued at well over $2 trillion. The iMac G3's processor chip, the PowerPC 750, is just as old and slow compared to modern chips. Despite that, it was chosen to power Perseverance, for many reasons.

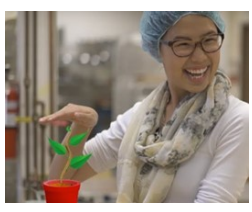
For one, it's the first processor to use dynamic branch prediction, still used to this day. It tries to predict where the code "branches off" at a place of decision, and runs the possibly upcoming code ahead of time. Today, chips are more complex, but the PowerPC 750 is optimal: less likely to break, yet still efficient - in fact, 10 times faster than those in old rovers. Perseverance has a NASA version of Apple's chip, the $200,000 RAD750. It blocks radiation, as Mars has no ozone layer, and withstands temperatures from -67 to 257 degrees Fahrenheit! What's more, this is not NASA's first time using the PowerPC 750: it powers the Curiosity Rover, Fermi Space Telescope, Lunar Reconnaissance Orbiter, and many others as well!

NASA's latest Mars rover has the same processor as an iMac from 1998 - The Verge

Here's Why NASA's Perseverance Rover Is Powered By A 23-Yr-Old CPU (fossbytes.com)

NASA's Mars Perseverance rover is powered by an iMac G3 processor - 9to5Mac

Pedagogy Pointers



Perfect for Spring: Code.org's "Plant a Seed" lesson is designed to help connect science and real life to algorithms and debugging. The lesson includes an introductory video with another "real life" example of algorithms and debugging. This lesson can be used as a cross-curricular science lesson as well. Aligns with CS K.3, 1.3 & 1.4, 2.3 & 2.4, 3.3 & 3.4; may need adaptation of materials for higher grades. Can be adapted for a cross-curricular lesson with Science K.7, 1.4, 2.4, and 3.6.

Introduction and video

Access the lesson and printables

On GoOpen VA: The Department of Education has published a great introductory lesson for 2nd grade students is available that can easily be adapted to meet the needs of other grade level's standards for computing systems. The focus on troubleshooting and identifying issues with computers is central to the computing systems standards. This aligns with CS standard 2.8, and can be adapted for K.6, 1.8, 3.9, 4.9 and 5.8. Amending specific vocabulary from the curriculum framework is strongly encouraged.

Access the lesson here

Computer Science in the Commonwealth

Welcome, Keisha Tennessee! Keisha Tennessee is the new Computer Science Coordinator for the Virginia Department of Education. She has over ten years of classroom experience, has a Career Technical Education (CTE) background, and is a National Board Certified Teacher. Keisha has worked with CodeVirginia for six years providing professional development for teachers. Likewise, she has worked on various writing teams to develop computer science micro-credentials and curriculum. She is an avid learner and strongly believes in the transformational power knowledge has within one's life.

For the past three years, she has served as the Computer Science Technology Specialist at CodeRVA Regional High School. A regional high school consisting of 14 partnering school divisions that focus on equity and inclusivity in computer science. While at CodeRVA, she was instrumental in the development of the computer science program, provided professional development in the integration of computer science, and led computer science initiatives for students and families. She believes that in today's modern society, computer science is a fundamental discipline. She finds learning is more engaging and authentic when there is an integrated approach and knows that computer science integration at the elementary and middle school level is a key component in the success of computer science.

Engaging All Learners

Computing systems can vary widely in size and scope, from handheld devices like smart phones to multi-billion dollar mechanisms like the Mars Perseverance Rover, which recently landed on the red planet to conduct surface-based studies of its environment. Perseverance's historic landing and mission sparked renewed national interest in aerospace engineering and technologies and once again launched conversations about the importance of diversity in these and other STEM fields. **Click here** to read the story of Christina Hernandez, a NASA Jet Propulsion Laboratory engineer who discusses how her Latina culture helped shape her work ethic and how she overcame childhood and diversity issues to ultimately play a key role in the Mars 2020 project.

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Old Dominion University

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