

# ARCS NEWS

Advancing Rural Computer Science

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

VOL. 3, ISSUE 7

APRIL 2023

## Announcements



Greetings and welcome to our April newsletter all about Computing Systems!

Thanks so much to our recent **KITS** (Keeping in Touch Sessions) participants. We had small but very interactive groups! Brad Fessler from Sphero provided training on how to use the Sphero Indi and Bolt in (K-5) classrooms. Lisa and Alexis provided training on using Bee-bots with (K-2) learners. Don't worry if you were not able to attend! The recorded sessions will soon be available on our TCEP YouTube channel. We are also sharing a wealth of free resources this month for all of our ARCS participants so that you can make the most out of using your classroom resources to integrate computer science instruction with your students (see below).



Coaching: Giving Feedback for Integrated Lessons Learning Byte with CodeVA  
Wed, Apr 12, 2023 6:00 PM EDT

Click each product link for free downloadable Educator Guides for [Sphero Indi](#) and [Sphero Bolt](#). Also, we are offering free access to the [Bee-bot Educator Curriculum](#) to all ARCS participants for one year. Follow this link to select "Bee-bot Lessons" and then enter this Login Code: WN9R6-J1DA1-R6AAH-6A4ZK-AYH4X (available through 3/24/24).

CodeVA is offering one more Learning Byte session this spring on April 12th at 6:00 PM EDT. For more information and to register [click this link](#).

We hope you enjoy your spring! As always, we welcome your comments, questions, and ideas.

The ARCS team

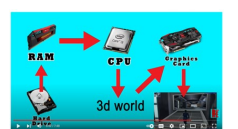
## Concept Corner



It is amazing how much computing power and storage capacity our modern computing devices have. It is even more amazing that how fast this has happened. The first modern computer, ENIAC, was built using vacuum tubes in 1945. It occupied a large room, weighed 27 tons, used a huge amount of power and had a teeny fraction of storage capacity and computing power of your smartphone! Tremendous increase in speed and storage capacity as well as miniaturization of devices was made possible by invention of the transistor in 1947 and the continuous improvement in technology of packing larger and larger number of transistors on a single silicon chip.

In 1965, Gordon Moore, co-founder of INTEL, predicted that the density of transistors that we pack on our computer chips will continue to double every 18 months. This is often referred to as Moore's Law and held true until very recently. With the current technology, it is possible to pack 100 million transistors in 1 square mm of chip space. Individual transistors have size that is about 100,000<sup>th</sup> part of the width of a human hair! However, it is unlikely that this can continue in future as we are coming up against limits due to laws of physics. This has led to a different approach for building more powerful computing systems e.g., quantum computers. [These resources](#) give a nice perspective on where we have been and where we might be headed.

## Pedagogy Pointers

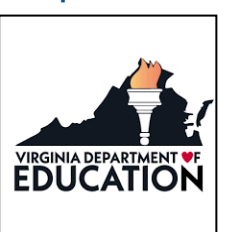


Before learning computer skills, children should have a general understanding of what a computer is and how it functions. Videos are an engaging strategy to teach students about basic computer components and to show them how hardware and software work together to do various tasks including sending, receiving, processing and storing information. Try this [Make it Easy Education video about Computer Fundamentals](#) for 3rd to 5th graders. For younger learners, this [Socratica Kids video](#) geared toward K-2nd graders not only introduces students to the components of a computing system, but also provides information about algorithms, coding languages, and careers in this field! [these resources are aligned with VDOE CS K.5; 1.7; 2.7; 3.8; 4.8; and 5.7.]



Unplugged coding activities using simple crafts are engaging and simple ways to teach computer science skills. This month, try this code.org lesson to introduce [binary code by making bracelets](#) with your students. Teach the entire 15-minute lesson or select the resources provided to create your own tailored learning activity!

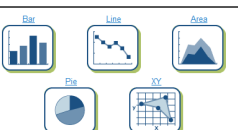
## Computer Science in the Commonwealth



The Virginia Department of Education, in partnership with Virginia Public Media, has developed new K-5 media resources. These videos will serve as instructional resources when teaching the K-5 computing system standards and will be uploaded to [#GoOpenVA](#).

These resources are anticipated to be released Summer/Fall 2023. Lastly, we encourage any educators and/or content experts who may be interested in serving on the 2017 Computer Science Standards Revision Committee, to submit a completed [application](#) by **Friday, April 28, 2023**.

## 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 celebrated its second anniversary on the surface of the red planet. 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. Learn more about the Perseverance Mars Rover [here](#), and [click here](#) to access NASA's Mars 2020 STEM Toolkit which includes games, activities and videos designed to connect K-12 students with STEM education topics related to the Mars 2020 mission.

United States Education Department Grant U411C190032. The contents of this newsletter were developed under a grant from the Department of Education. However, those contents do not necessarily represent the policy of the Department of Education, and you should not assume endorsement by the Federal Government.

Old Dominion University

The Center for Educational Partnerships

Have a question or feedback for us? Email [TCEP@odu.edu](mailto:TCEP@odu.edu)

Website: <https://www.odu.edu/tcep/arcs>

Tel: 757-683-5449