ARCS NEWS

Advancing Rural Computer Science

Announcements

Greetings! Welcome to our March ARCS newsletter. Let's spring into some new computer science updates.

This month's theme is **Algorithms and Programming**. An algorithm is a set of instructions for solving a problem or accomplishing a task. Everyday examples of algorithms include: following a recipe, tying your shoes, navigating with GPS, searching for information online, sorting a list alphabetically, and deciding what to wear based on weather—essentially any set of defined steps to get a job done.

As we proudly celebrate Women's History Month, we honor the incredible contributions women have made in the field of computer science, particularly in algorithms and programming. Throughout history, pioneering women like Ada Lovelace, often regarded as the first computer programmer, and Grace Hopper, a trailblazer in developing programming languages, have paved the way for future generations. Explore their stories and more in the New York Time Magazine's article **The Secret History of Women in Coding**.

CodeVA has also opened its spring calendar! All current ARCS participants are encouraged to complete at least four Learning Bytes sessions. Each session is offered on a Wednesday and runs from 6-7 PM. To assist you in planning your schedule, please see below for the dates and descriptions of each session:

- March 5: **Getting Started: Programming with Twine**—Get the basics of learning to program with the interactive narrative game and storytelling tool, Twine!
- March 12: **AI Basics**—Examine your understanding of AI and Machine Learning with this one-hour Learning Byte!
- March 19: **Getting Started: Physical Computing**—Explore computing systems and algorithms & programming through physical computing tools!
- March 26: **Teaching Networks & the Internet Unplugged**—Investigate how to teach concepts about networking and the Internet in an unplugged way.

Learning Bytes Registration Link: **Learning Bytes by CodeVA | Eventbrite**. For registration support, please email Valerie Fawley at **valeriefawley@codevirginia.org**.
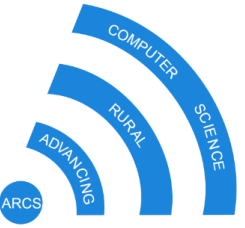
We would also like to send a huge thank you to those that completed the ARCS midyear implementation survey. Please be on the lookout for the end of year survey for more opportunities to share your experiences and provide feedback.

As always, don't hesitate to reach out to us a **TCEP@ odu.edu** if you have comments or questions.

The ARCS team.

Concept Corner
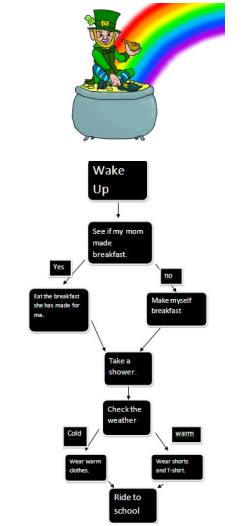
St. Patrick's Day and its respective festivities are coming up; traditions of wearing green, seeking shamrocks, and embracing the spirit that, somewhere, a leprechaun is out fulfilling the folklore emerges. Yes, it's odd to think algorithms and programming are tied to a holiday from the 4th century. To some, these words sound intimidating, but what's not realized is, as we live and learn through daily experiences, our brain "programs" itself to complete tasks with our very own "algorithms" every day!

An algorithm is a step-by-step process to complete a procedure. A "machine" (like a computer, or your brain) is programmed to "run" it. It's that simple! There's an algorithm for every task. When leprechauns look for gold, they look for rainbows - if they find one, they stop searching and run to it. If there's a pot of gold, they grab it. When looking for a four-leaf clover, we use a familiar algorithm: if we find clovers, go and check each one. If it has three leaves, keep looking - if it has four, keep it and stop looking. Enjoy the lucky charm!

How do you wake up? Some folks sit up then cut the alarm; some turn it off first (highly inadvisable!). How do you brush your teeth? What part of your outfit do you first put on? Our brains form these algorithms subconsciously, following mental "flow charts" that split with each decision. Over time, algorithms are programmed for repeated tasks. However, unlike brains, we use code to program algorithms into computers (a different language than the brain's). This is where computer science comes into play.

Pedagogy Pointers

For lower elementary on GoOpenVA: Grid Challenge is an available lesson plan involving a hands-on approach to algorithms and sequencing. Students can do this activity unplugged or with programmable robots like **Bee-Bot**. The lesson includes suggestions for modifying and making the lesson fun, as well as provides the grid needed to conduct the lesson. Aligns with CSK.1, CSK.2., CS1.1, CS1.3, CS2.1, & CS2.3. **Access the Lesson Plan**

For upper elementary on St. Patrick's Day: Tynker offers a fun coding project where students can build and command a monster or leprechaun that collects four leaf clovers. The lesson walks students through how to create the game and make it into their own platformer. Aligns with CS3.2, CS4.2, and CS5.2.

Tynker St. Patrick's Day Project

Computer Science in the Commonwealth

As part of an ongoing commitment to support educators in integrating computer science into their daily teaching, CodeVA has introduced the **Computer Science Integration Resources**. These resources are conveniently housed on the **GoOpenVA.org** website and provide educators with easy access to valuable materials and tools specifically aimed to aid teachers in seamlessly incorporating computer science standards into various subjects and curricula. Key Features of CodeVA Resources include:

- **Planning Resources:** Comprehensive materials including templates and sample lessons.
- **Cross-Curricular Integration Opportunities:** Resources that highlight ways to incorporate computer science into subjects like math, science, and humanities, enhancing relevance and learning.
- **Standard Alignment Guides:** Detailed guides aligning computer science teaching with VDOE SOLs.
- **Additional Support and Resources:** Access to online workshops, community forums, and innovative teaching tools to further assist educators in integrating computer science.

By leveraging these resources, educators can create an engaging learning environment that encourages students to explore computer science concepts, empowering the next generation of critical thinkers and problem-solvers for a technology-driven future.

Instructional resources created by ARCS participants can also be found on GoOpenVA in **The Center for Educational Partnerships (TCEP) at ODU** group.

Engaging All Learners

When we think of computer science, often the first topic that comes to mind is programming – a concept that can be both exciting and daunting. Educators and researchers agree that computer science education pathways and careers can be enhanced by using role models to highlight opportunities and experiences in computer science, including coding and programming. Recognizing this, **Code.org**, a non-profit agency whose mission is to expand access to and participation in computer science for all students, developed a series of videos which feature celebrities and everyday people undertaking computers science tasks and/or sharing their experiences in computer science careers to promote the reality that computer science is truly for all learners. You can access their YouTube channel at **https://www.youtube.com/@codeorg/videos**. It includes a repository of informational videos, many of which are under two minutes in length.