

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!

We hope everyone had a good winter break.

In this newsletter, we emphasize the CS strand of Data and Analysis. In Concept Corner, we define three interrelated practices—data analysis, data analytics, and data mining—that, among other things, can provide the public with important and timely information through the creation of online dashboards.

Speaking of dashboards, in this month's Computer Science in the Commonwealth we share a link to the Virginia Computer Science Dashboard. It has interactive features that let you explore the data on secondary level computer science education in the Commonwealth. If you have a moment, browse the dashboard. You can find out more about the CS opportunities your K-5 students may have once they enter high school, and the participation of various subgroups of students in upper-level CS courses.

Finally, with the new year we have a new section in our newsletter! In this section, titled Engaging All Learners, we will be focusing on ways to broaden participation in Computer Science. There is a link in this section where you can learn more about the Culturally Responsive Teaching approach that guides this component of ARCS.

As always, we welcome your comments, questions, and ideas.

The ARCS team.

Concept Corner



Data -- Analysis, Analytics, and Mining

Data Analysis is a process of examining, curating, transforming, and modeling data with the goal of discovering useful information, which informs conclusions and supports decision-making. Examples of data analysis that you might have already encountered or carried out are the creation and use of data tables, bar graphs, or pie-charts. Each of these allow us to arrange our data in a systematic way which makes it easy to obtain useful information about the data. The advent of powerful computing devices, high-capacity data storage devices and high-speed communication networks has transformed the way we collect, analyze and utilize data.

There are many other Data X terms that we hear about these days; for example, Data Analytics and Data Mining. As you might expect, they are related to Data Analysis. **Data Analytics** is an overarching discipline that encompasses the complete management of data. This not only includes data analysis, but also data collection, organization, storage, and all the tools and techniques used. **Data Mining** is the process of discovering patterns in large data sets – data sets that cannot be looked at, let alone analyzed by humans in any reasonable amount of time. Companies like Amazon and Google collect data on what people search, then use Data Mining techniques on this data to come up with recommendations for products for you to buy or show you targeted advertisements based on your searches. As a topical example, data analytics tools allow us to collect, store, analyze, publicly share and display data related to the COVID-19 pandemic on a daily basis.

Pedagogy Pointers



For all levels: Data Nuggets is an open-source, free, quantitative lesson planning collection that has resources available for all levels of learning that can be integrated into almost any curriculum. The lessons are designed to present students with data and provide them opportunities to draw conclusions and support those conclusions with evidence. The lessons align with CS 3.12.

[Data Nuggets main page](#)

[Data Nuggets Lesson Collection](#)



Free Video Lesson: BrainPOP Jr.'s free lesson on data analysis includes an overview for elementary-age children on reading and interpreting bar and tally graphs. The video lesson includes a quiz and other interactive activities once the video is complete. If your school or school district has access to BrainPOP Jr., the site has a number of other useful data-related video lessons. The lesson aligns with CS 2.11.

[Graph Video Lesson](#)

[BrainPOP Jr. Data Videos Lessons](#)

Binary Bracelets: The concept of binary can be hard to grasp, but this [activity](#) uses math and the common material of perler beads to help students turn decimal system numbers and the alphabet into binary (0's and 1's). There's even a "cheat sheet" for quick reference! The lesson aligns with CS 4.12 and 5.13.

Computer Science in the Commonwealth



Virginia Computer Science Dashboard

As teachers you are preparing your students for the future. The Virginia Department of Education has put together an interactive computer science dashboard called [Virginia's High School Computer Science Profile](#) that shows data on computer science in Virginia high schools. What do you notice for your area?

Engaging All Learners



Culturally Responsive Teaching

In line with one of the ARCS project's stated goals, our team is excited to introduce a new project component to support diversity in computing through strategies that will broaden participation in computer science, particularly among our female and minority students. We will be sharing information, resources, and strategies designed to support computer science teaching and learning to engage all learners through Culturally Responsive Teaching (CRT). This month, we provide an introduction to CRT and the theory behind it, developed by Dr. Geneva Gay, Professor of Education at the University of Washington-Seattle. Click [here](#) to learn more about the CRT theory that the ARCS project will employ and to read more about Dr. Gay's philosophy on CRT.

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