

CS Ed Week 2020

Bring CS Home

December 7th - 12th



CodeVA

www.codevirginia.org
#BringCSHome

A special welcome to our VIP guests

First Lady Pamela Northam
U.S. Representative Abigail Spanberger
Virginia Secretary of Education Atif Qarny
Virginia Superintendent of Public Instruction James Lane

This event is presented by



The CS In Your Neighborhood Competition is powered by

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A special thank you to our volunteers from

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Welcome to Virginia's Computer Science Education Week!

Virginia's Computer Science Education Week (December 7th-13th, 2020) is a week, declared each year by Governor's proclamation, dedicated to celebrating and encouraging students, teachers, and families to engage with computer science. CodeVA, partnered with the VDOE and statewide CSTA chapters, offers an entire virtual week of speakers, Family Code Night events, kids activities, student competitions with prizes, and PD sessions for educators, kids and families to get as many people across Virginia using, playing with, and learning about how computer science affects their everyday lives.

All of us are spending more time at home than ever before, so we here at CodeVA want to provide meaningful virtual opportunities for CS learning that engage with our home environments and #BringCSHome. Students, parents, and educators alike will spend this week working, playing, learning, and hearing from a diverse range of CS professionals along with Congresswoman Abigail Spanberger, First Lady Pamela Northam, Secretary of Education Atif Qarni, and State Superintendent James Lane.

Thank you for joining us, let's have some fun and #BringCSHome!

Event Schedule

07 Monday	08 Tuesday	09 Wednesday	10 Thursday	11 Friday	12 Saturday
9:00 AM CS Ed Week Launch!	10:00 AM Shake It, Program It! for K — 2nd Grade	10:00 AM Shake It, Program It! for 3rd — 5th Grade	9:00 AM App in an Hour: Make a Game! for Middle and High Schoolers		10:00 AM Doodle Jam with Saxton Moore
3:30 PM CS Learning Series Session CSTA Blue Ridge	7:00 PM Integrating CS- Sparking Ideas Twitter Chat	5:00 PM CS to the Core K—5 Overview	5:00 PM CS to the Core Middle School Overview		
8:00 PM Family Code Night		9:00 PM Family Code Night	5:00 PM & 8:00 PM CS In the K5 Classroom Educator Webinar		

A Letter from the Executive Director

Who could have predicted the enormous challenges, changes and upheaval that have faced public school educators during 2020? Our teachers are our heroes. And we owe them a debt of gratitude for their commitment. For stepping up to the challenge - and into the virtual classroom - for the sake of our children.

CodeVA says thank you to all of Virginia's educators, for your amazing capacity to be learners even as you are our teachers.

Considering the challenges of 2020, it's easy to see this year as a year of loss and of missed opportunities, but I'm reminded of an old Zen parable that seems particularly fitting during this season of change.

The story goes like this:

"Once upon a time there was an old farmer who had worked his crops for many years. One day his horse ran away. Upon hearing the news, his neighbors came to visit. 'Such bad luck,' they said sympathetically.

'Maybe,' the farmer replied.

The next morning the horse returned, bringing with it three wild horses.

'How wonderful,' the neighbors exclaimed.

Again, 'Maybe,' replied the old man.

The parable continues with an alternating series of seemingly good and bad luck episodes. With each, the farmer replies, "maybe" as his neighbors celebrate his luck or lament his loss.

The power of Maybe, I like to think, is closely related to the power of possibility. And I'm proud that CodeVA was able to use its power of Maybe this year to provide more than 20,000 hours of **professional development** to more than 1,000 Virginia educators across the Commonwealth, through online instruction in the midst of the pandemic. And I'm proud to say that Virginia educators clearly remained committed to bringing Computer Science literacy to their classrooms.

In addition to training teachers, CodeVA also pivoted with its **Eureka Workshop children's programs**, using the power of Maybe to bring online arts and music-integrated computer science summer programs to more than 1000 students. We also launched **Project Snail Mail**, going lo-fi to bring high tech fun to thousands more students and their families through a free, monthly activity booklet full of STEM and computer science activities.

The power of Maybe is the power to see beyond the challenge - beyond the problem - to an innovative solution that helps people. And looking back on 2020, I try to remember to trust that fortune and misfortune tend to travel as a pair. Sometimes seemingly bad things lead to the discovery of unexpected blessings.

Remember: *Maybe*.



Chris Dovi

Executive Director, CodeVA



A Note from Our Sponsor: Capital One

We are proud to partner with organizations like CodeVA, the City of Richmond, and our regional school districts to highlight the importance of computer science education and technical skills. We all know that technology is changing our world: breaking down barriers, unleashing ideas and opportunities like never before. But as technology hurtles us toward a more productive and prosperous future, the sheer pace of change threatens to leave many behind.

With looming gaps in education, skills, and earnings, opportunity is out of reach for many. At Capital One, we believe that by advancing the economic and social opportunities in the communities in which we operate, **we can advance business outcomes while helping people thrive**. In support of that belief and our mission to change banking for good, we launched the *Capital One Impact Initiative*. The Initiative was created to advance socioeconomic mobility, a long-standing societal issue, by advocating for an inclusive society, building thriving communities and creating financial tools that enrich lives. It is fueled by an initial \$200 million multi-year commitment in community grants to **catalyze economic growth in low- and moderate-income communities** and **close gaps in equity and opportunity**. We believe it's our responsibility to leverage our scale and resources, and the ingenuity and empathy of our associates, to help **foster a world where everyone has an equal opportunity to prosper**.

Capital One is committed to providing support for innovative programs and services that are helping more Americans succeed in the digital age. We want to thank CodeVA, the Richmond City Council, and our regional superintendents for their vision, support and advocacy of Computer Science education.



Launch Video Agenda

- | | |
|---|---|
| 01. Introduction | 10. Interview with Samina Modal |
| 02. Tour of the Digital Dominion Begins | 11. Computer Science Career Highlight |
| 03. Remarks from Abigail Spanberger, U.S. Congresswoman | 12. Omar Ansari, SVT Robotics |
| 04. Computer Science Career Highlight | 13. Computer Science Educator of the Year Award |
| 05. Brian Houston and Jean Normandy, Facebook | 14. Winner Announcement by James Lane |
| 06. CS in Your Neighborhood Competition
<i>Powered by Facebook</i> | 15. Computer Science Career Highlight |
| 07. Winners Announcement by Atif Qarni, State Education Secretary | 16. Samantha Smith-Herndon |
| 08. Computer Science Career Highlight | 17. Remarks from Kurt Engleman, Capital One |
| 09. Jurrand Summerville, Mission Lane | 18. Remarks from Governor Ralph Northam and First Lady Pamela Northam |
| | 19. Closing |



Congratulations to this year's winners
for their outstanding submissions highlighting
the important role Computer Science
plays in their neighborhood and across the
Commonwealth of Virginia!



Gwendolyn Sturgis
Shon Bennett
Jonah Marlowitz
Miles Thomas
Alexander Beyerl
Rushella Epperson
Jonathan Vostroknutov
Keira Schoolcraft
Austin Sanders
Brooke Hess
Parker Pattishall
Kendra Robinette
Pepper Maranto



Full STEAM Ahead is an annual Science, Technology, Engineering, Art, and Math (STEAM) completely online conference for rising 6th-9th grade girls that happened August 3rd to 7th, 2020. This unique event presented by CodeVA and CarMax provides middle school girls in Virginia with an opportunity to learn through hands-on workshops hosted by women currently working in a diverse range of STEAM professions.

Research has shown that in elementary school, girls show equal interest in STEM topics, but by eighth grade, girls' interest is only half that of boys'. Additionally, arts integration boosts test scores, analytical thinking, reasoning and social competencies. By providing connections with role models in STEAM through engaging workshops, Full STEAM Ahead aims to empower Virginia's girls to continue their pursuit of STEM education.

With many in-person summer camps and programs needing to cancel in-person this summer, Full STEAM Ahead's 4th annual event was held online over multiple days as an opportunity for parents to keep their middle school girls engaged and learning over the summer across the Commonwealth. Pivoting the event online expanded the reach of the event beyond the greater Richmond area to support, entertain, educate, and encourage middle school girls statewide.

Both CodeVA and CarMax are excited to continue to provide an event aimed at encouraging middle school girls to pursue STEAM interests and future career opportunities.

Middle school girls heard from keynote speaker Ruthe Farmer, CSforAll's Chief Evangelist. Ruthe Farmer has worked passionately to integrate innovative business strategies into social change efforts while working with Aspirations in Computing, the TECHNOLOchicas campaign for Latinas, AspireIT outreach program, Intel Design & Discovery, Lego Robotics for Girl Scouts and more.

Since 2017, hundreds of girls from the greater Richmond area have been impacted by Full STEAM Ahead, and CodeVA and CarMax look forward to presenting this and many more opportunities for young girls to explore, investigate, and enjoy STEAM.

33
Workshops
Hosted

206 Attendees

43
**Scholarships
Awarded**

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CARmax[®]



Family Code Night is a family-engaging online learning experience which any elementary school in Virginia can now offer to all its families--requiring next to nothing of the school. The free one-hour evening event uniquely engages K-5 children and a parent or guardian in the delightful experience of doing their first hour of computer programming, together. Family participation is a simple but profound innovation in this event – parental support can change the trajectory of a child's computer-science learning, and the family's appreciation and support for that learning. The result is a memorable learning experience, and new family, social, and school momentum to drive future computer science learning.

[Learn More!](#)



Computer Science Teachers Association



CS ED WEEK 20
#CSFORSOCIALJUSTICE
DECEMBER 7-13

Join the CSTA community to connect, grow, and share with computer science teachers. *Find the right membership for you:*

CSTA Basic Membership: Our Basic tier allows any CS teacher, regardless of funding ability, to connect to their local and national community. As a Basic member, you can join your local chapter, receive key updates from CSTA national, and connect with fellow CS teachers.

CSTA+ Membership: In this tier, you'll receive all of the Basic benefits and also unlock access to valuable resources, discounts, and professional development to your teaching practice. CSTA+ membership strengthens local CS communities, as 50% of dues directly support CSTA chapter programs.

Project Snail Mail

We are all interacting digitally more than ever before. CodeVA loves working online, but in a time where screen overload is a regular concern we think it's time to take a different approach. We're excited to let you know that Eureka Workshop is sending out a free subscription to fun and educational activities for your child or family to receive in the mail with Project Snail Mail!

All of the resources you and your student(s) will receive will be as accessible as possible and will include instructions for games you can play at home, a craft or STEAM activity, a coloring page and additional STEAM resources for parents and students. We will be issuing these resources on a regular basis and cover a range of STEAM projects!

- [View Our Archive!](#)
- [iRegistrarse Hoy!](#)
- [Sign Up Today!](#)

intro to ciphers

One of the earliest known forms of encryption is called a substitution cipher. We will be using a simple form of a substitution cipher where you replace each letter of the alphabet to the left or right. This is also called a Caesar cipher, named after the Roman leader Julius Caesar who used this kind of cipher to send secret messages.

The example here shifts the alphabet 3 to the right. So, the letter A becomes the letter D, the letter B becomes the letter E and so on. To use this form of a cipher to encrypt a message, we would use our new alphabet to create our message.

A	B	C	D	E...
D	E	F	G	H...

Original Alphabet
ABCDEFGHIJKLMNOPQRSTUVWXYZ

Ciphered Alphabet
DEFGHIJKLMNOPQRSTUVWXYZABC

Our Secret Message

Plaintext: Hello World
Ciphertext: Khoor Zruog

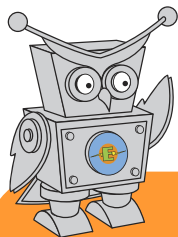
The number of shifted letters and the direction shifted is our encryption key, so for someone to decrypt the message they would need to know our encryption key and then they would run through the same process *in reverse*.

Decrypt the following messages encoded with the encryption key above!

Ciphertext: FRGLQJ
Plaintext: _____

Ciphertext: VW/HDP
Plaintext: _____

Ciphertext: FRPSXWHU VFLHQFH
Plaintext: _____



Communication Trivia!

How many of these trivia facts did you already know? Try making a communication technology timeline!

There are cave drawings that predate language!

Carrier pigeons were raised and domesticated to fly to a familiar location with a message tied around their leg!



Smoke signals are one of the oldest forms of long-distance communication!



There are over 6,500 different spoken languages today!

The Greek's Antikythera Mechanism was the first "computer", but it was fully analog. It used spinning gears to predict the locations of the planets and timing of eclipses. In analog technology, moving parts are used to repeat a single task, like a program.

Digital technology came much later, when the transistor was invented in 1947. Digital technology uses a binary system of "on" or "off" switches, sometimes hundreds or thousands of them.

A compiler is a script that translates other code languages into binary. As a developer, it's a lot easier to use Python or Java, but binary is the only language computers understand.

Activity: binary images

Binary means "something having two parts." For computers, those two parts are 1's and 0's called binary code. Computers turn all types of data into binary code through a process called encoding. Encoding is changing data from one form to another, such as turning a picture into 1's and 0's. Decoding is returning the encoded data to its original form.

We are going to explore using a binary code to encode pictures! Since we're using binary code, we only have two options. For pictures, our binary system is going to be made up of white squares and black squares. With only these two options we are going to encode pictures into numbers, decode numbers into pictures, and create our own examples!

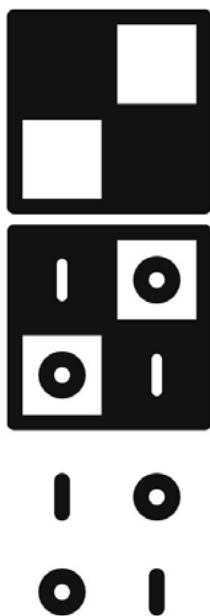
Looking at the picture to the right, we can see that there are only two colors.

To encode this picture we need to represent the data in binary code. This means using 1's and 0's to represent our squares. **1 is going to represent our black square** and **0 is going to represent our white square.**

Using 1's and 0's we can encode the picture as so:

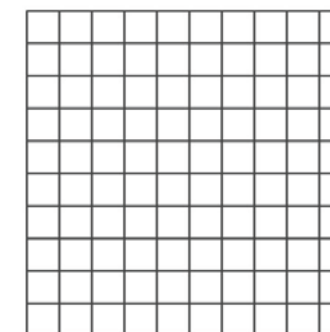
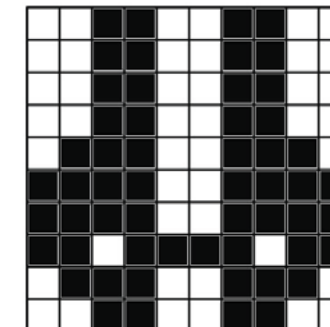
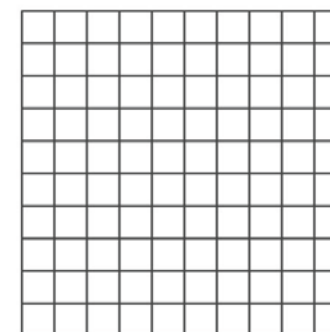
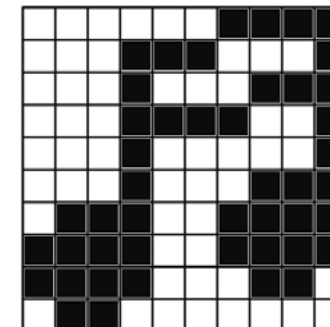
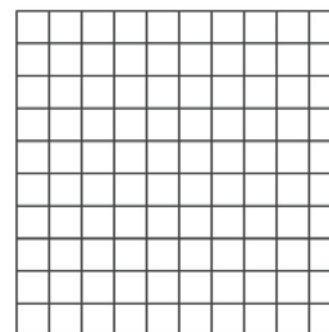
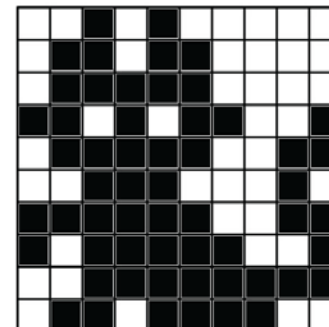


To decode our 1's and 0's we would run the process in reverse and changes each 1 to a black square and each 0 to a white square.

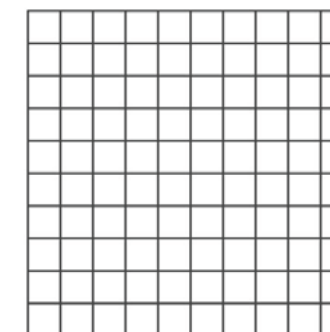
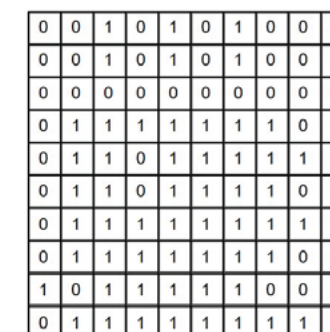
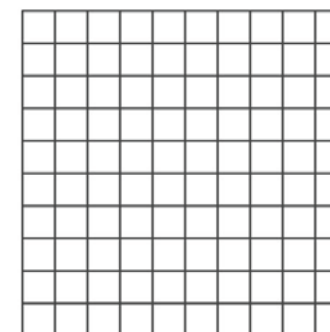
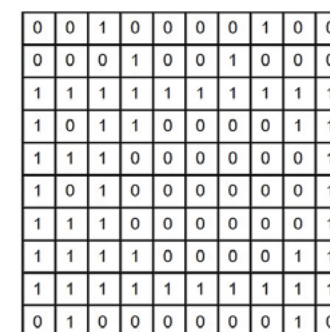
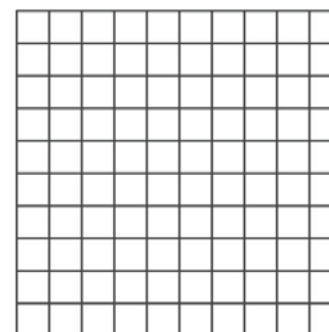
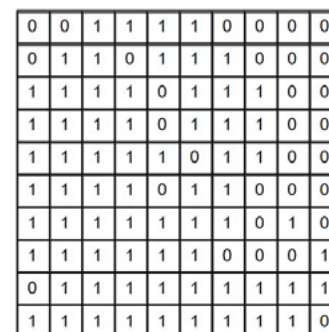


Use the encoding examples below to encode the pictures!

Fill in the blank grid below each picture with the 1's and 0's that match the white squares and black squares to encode it.



With the decoding examples decode the 0's and 1's back into a picture. Using the grids below fill in each square with a 1 and leave each square with a 0 blank to decode the data back to a picture.

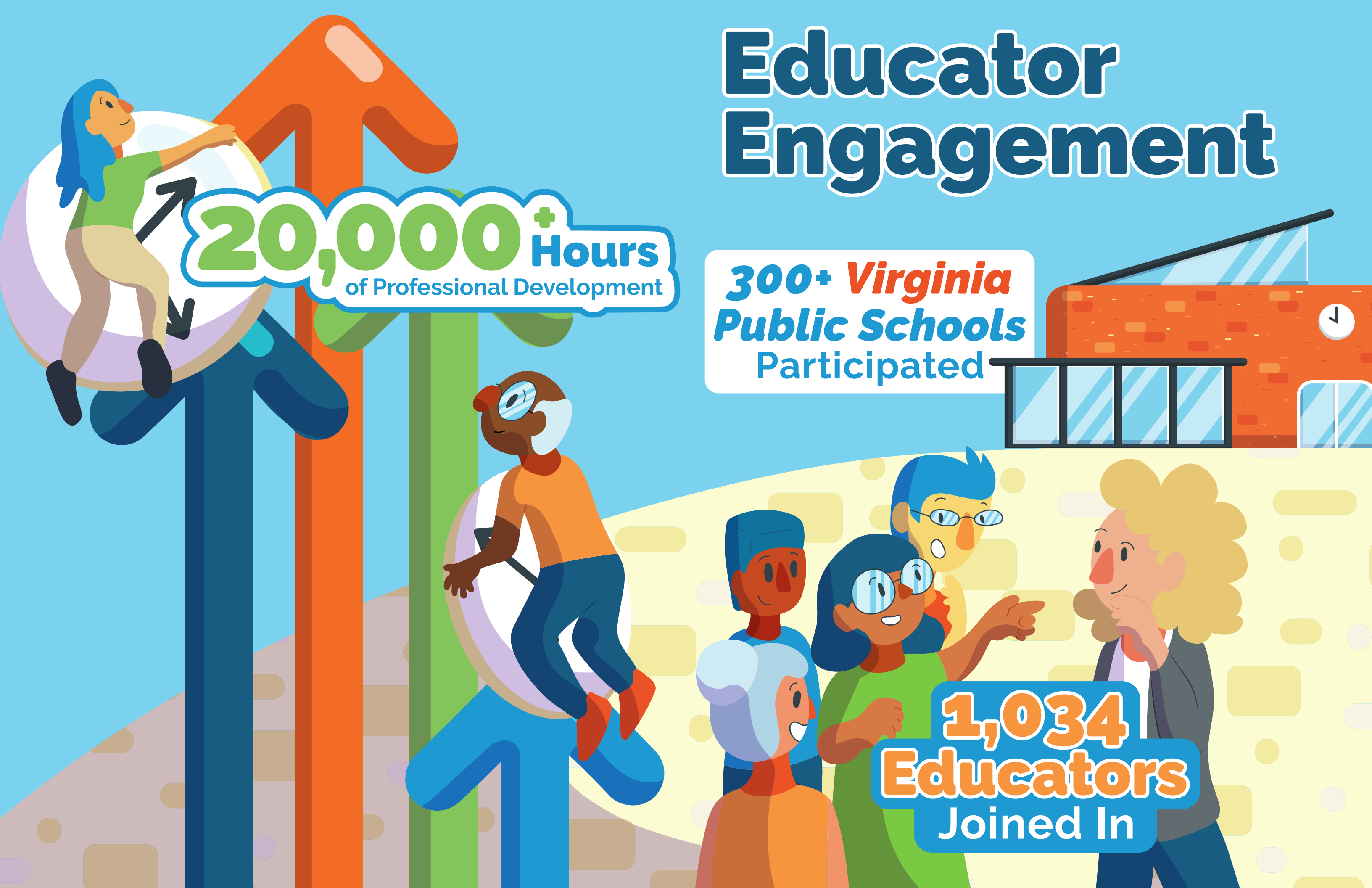


Educator Engagement

20,000⁺ Hours
of Professional Development

**300+ Virginia
Public Schools**
Participated

**1,034
Educators**
Joined In



EUREKA

Workshop



819
Students Served

40%
of students recieved
Full Financial Aid

1,800
Snail Mail
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Español!



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