Four years ago, the Virginia General Assembly passed groundbreaking, first-in-the-nation legislation mandating computer science (CS) literacy as a requirement for all Virginia students. The legislation, and the resulting Virginia Standards of Learning (SOL) for CS, requires CS as an integrated subject for all Virginia students from kindergarten to 8th grade, and establishes mandatory standards for a pathway sequence of elective courses for middle and high school. This legislation, along with CodeVA’s computer science-focused professional development program for K-12 public school teachers and validated awareness by state leaders of the importance of CS to Virginia’s present and future economy, have helped define a series of recent successes promoting Virginia as a state that invests in future workforce necessary to high tech industry and advancement. Not the least among these successes have been announcements by companies like Amazon, Microsoft, and others of significant business development investments in the Commonwealth. Amazon explicitly cited the K-12 CS SOL as an influence in its decision to locate its HQ2 in Virginia. Policy and implementation are two different things:

In 2019, the Virginia budget took an important step of providing direct state funding to the state’s existing computer science teacher professional development initiative. CodeVA. CodeVA is a nonprofit organization founded in 2013, which in addition to providing statewide scaled teacher professional development at no cost to school divisions and teachers, also has served as an advocacy resource for the state, and played a role in the 2016 CS SOL mandate legislation by crafting the legislation that was adopted. While the organization is independent in its governance, it works closely with the Virginia Department of Education and other education and industry stakeholders to ensure Virginia has regionally accessible capacity for teacher professional development and school division resources.

In addition to state funding, CodeVA also brings to bear resources from other state agencies, including the Virginia Tobacco Commission, numerous higher education centers in southwest and Southside Virginia, Federal research funding from the National Science Foundation and the U.S. Department of Education, as well as monetary contributions from corporations and foundations alike. At its core, CodeVA is a comprehensive, scalable, statewide Computer Science teacher training, support and curriculum development nonprofit organization, founded with the intention of ensuring that Virginia students are ready to meet the ever-progressing demands of a 21st century workforce. CodeVA’s combination of funding, public and private partnerships, expertise and capacity provide a path forward to ensuring computer science literacy for all Virginia learners.

A national model for other states also engaged nationally in what is known as CSforALL. CodeVA is a proven and cost-effective means of ensuring high-quality, teacher led Computer Science professional development is available to Virginia classroom teachers. The program also works with national partners, research institutions, and - most importantly - Virginia teachers to develop and iterate curriculum and resources that follow a student from K-5 formative literacy to middle school embedded use of concepts in other subjects like math, science and social studies, and on to high school language-specific standard and advanced-level pathways classes.

Summer 2020 Training Evaluation

During the winter and spring, CodeVA undertook a significant expansion of its statewide faculty from 30 instructors to 42. CodeVA’s model for recruiting, evaluating and appointing its faculty members relies on a graded rubric utilizing four domains of focus to ensure qualified and quality instructors: knowledge of computer science and adult learning; training session quality; collaboration; and professionalism. This model for facilitator recruitment developed in Virginia is becoming a copied model in other states similarly expanding their CS teacher training initiatives. All CodeVA faculty are Virginia public school classroom teachers, and this criteria is also essential to the training model, in which current Virginia classroom teachers are the audience. Both national research and best practices, as well as CodeVA’s own experience, has proven that adult professional learning works best when the instructor is a peer with practical knowledge in addition to the specialized content knowledge in CS. In response to COVID-19, CodeVA transitioned all of its summer professional development sessions to an innovative online delivery format. In addition to requiring the replatforming of more than 1200 hours of educator-facing content instruction from in-person to online, it also involved replatforming hundreds more hours of faculty-facing content and instruction, as all of CodeVA’s faculty needed to be brought up to speed on online delivery of planned professional development. In preparation for summer sessions, and to extend support to educators, CodeVA offered an hour-long “Coffee Break” before each of the trainings for attendees to check their technology, get a chance to meet their facilitators, and interact with fellow participants. The daily virtual format of each course consisted of a two hour synchronous live session, three hour asynchronous work session, and a one hour “office hours” where CodeVA faculty were available to participants for feedback and support. Finally, CodeVA also implemented a live Help Desk for all sessions. Additionally, several new professional development courses were introduced this summer in response to teacher requests for more hands-on coding experience and understanding of how to blend the Virginia Computer Science SOL’s across content areas. CodeVA also offered the “Elementary CS Starter Pack,” a week-long training consisting of three of CodeVA’s existing elementary-level stand-alone sessions. As described in the Effectiveness section of this report, participant feedback during all programs has been extremely positive, with teachers expressing statistically significant increases in CS self-efficacy and confidence.
Attendance

CodeVA delivered over 20,000 hours of professional development training to 1,034 educators in 45 separate professional development sessions from April through July with an average 64.1% attendance rate (attend/registrations).

The map in Figure 1 illustrates the over 300 Virginia public schools with teachers who participated in CodeVA’s summer 2020 virtual training.

Figure 2 shows the CodeVA 2020 teacher attendance by Region. Region 2 - Tidewater had the most participation with 32%, followed by Region 4 - Northern Virginia (21%), Region 6 - Western Virginia (18%), Region 1 - Central Virginia (12%), Region 5 - Valley (6%), Region 8 - Southside (4%), and Region 3 - Northern Neck and Region 7 - Southwest (3%).

Figure 3 breaks down summer attendance by grade-level training. As in 2019, the majority of participants attended elementary level sessions (524). Educators also attended middle school (290), overview (163), and high school level sessions (57).

Summer Training Sessions

CodeVA delivered 45 training sessions during the summer of 2020. The specific programs CodeVA delivered virtually are listed below.

High School Programs
- AP Computer Science Principles
- Computer Science Foundations (Exploring Computer Science)

Middle School Programs
- Middle School Coaches Academy
- Middle School Elective (Computer Science Discoveries)
- Project GUTS
- Middle School/High School Code - Coding in Python
- Middle School Integration*

Elementary School Programs
- Elementary Coaches Academy
- Launching Computer Science & Google CS First
- K-5 Code - Coding in Scratch*
- K-5 Integration*
- Virginia Computer Science Standards of Learning (SOL) Deep Dive

*Denotes new course
Content

“They did an awesome job doing this training online. The experience of being a student in the class was great as we will have the same situation in a month. Projects were connected to class and curriculum...very relevant.”

As part of CodeVA’s continuing program evaluation, participants were asked to rate various aspects of the training: overall rating; amount of content covered; content rigor; session pacing; and required workload. Because the training this summer was delivered in a new format, questions were also posed about the online experience. Participants responded to statements on a Likert scale from one to five, where five represented the strongest agreement and one represented the strongest disagreement. Across every measure, CodeVA received an average of at least four out of five. See Table 1 for results.

Table 1. Summer 2020 Survey Results

<table>
<thead>
<tr>
<th>Prompt</th>
<th>Average Across Programs*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Online Experience</strong></td>
<td></td>
</tr>
<tr>
<td>I found online PD just as informative as in-person PD.</td>
<td>4.49</td>
</tr>
<tr>
<td>This PD session met my needs as a teacher-learner.</td>
<td>4.45</td>
</tr>
<tr>
<td>I felt a relationship with other participants.</td>
<td>4.03</td>
</tr>
<tr>
<td>I felt part of the learning community.</td>
<td>4.20</td>
</tr>
<tr>
<td>I felt a relationship with my facilitator.</td>
<td>4.43</td>
</tr>
<tr>
<td>I am satisfied with my interaction with my peers and facilitator.</td>
<td>4.24</td>
</tr>
<tr>
<td>I found the instructional methods (e.g. collaborative Google Slides, reflections, etc.) effective.</td>
<td>4.23</td>
</tr>
<tr>
<td>I am likely to attend and in-person CodeVA session in the future.</td>
<td>4.44</td>
</tr>
<tr>
<td>I am likely to use the strategies, resources, curriculum learned about in the session this upcoming year.</td>
<td>4.33</td>
</tr>
<tr>
<td><strong>CodeVA Experience</strong></td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>4.42</td>
</tr>
<tr>
<td>Amount of content covered</td>
<td>4.34</td>
</tr>
<tr>
<td>Content rigor</td>
<td>4.36</td>
</tr>
<tr>
<td>Pacing of session</td>
<td>4.37</td>
</tr>
<tr>
<td>Workload</td>
<td>4.39</td>
</tr>
</tbody>
</table>

Table 2. Facilitator Ratings

<table>
<thead>
<tr>
<th>Prompt</th>
<th>Average Across Programs*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Facilitators</strong></td>
<td></td>
</tr>
<tr>
<td>Knowledge of content</td>
<td>4.72</td>
</tr>
<tr>
<td>Delivery of content</td>
<td>4.53</td>
</tr>
<tr>
<td>Preparedness</td>
<td>4.69</td>
</tr>
<tr>
<td>How likely are you to recommend CodeVA Training to someone? (1 = not likely; 5 = very likely)</td>
<td>4.60</td>
</tr>
</tbody>
</table>

*1 = Lowest; 5 = Highest
Effectiveness

One of the most important missions of CodeVA's computer science professional development is to engage and empower educators who may have little or no prior computer science experience.

To evaluate how the training is accomplishing that mission, pre- and post-training surveys focused on self-efficacy and understanding of content were administered to participants. Respondents reported agreement or disagreement with statements such as “I understand what Computer Science is” and “I am familiar with teaching strategies that are effective at my grade level for teaching computer science.” Results showed statistically significant increases in almost every measure across all programs.

Amplifying Impact

With funding from Amazon, this year CodeVA has begun the CS Ready Schools program with a pilot program of up to 20 high needs public schools across Virginia. This program will help schools develop whole-school computer science implementation strategies, and provide computer science professional development and support to students, teachers, counselors, and administrators. After evaluation and improvement of the pilot implementation, the CS Ready Schools program will expand to more schools across the commonwealth over the next four years.

To deepen the understanding around student and teacher learning of computer science CodeVA currently participates in several national research grants. These include:

- **CSforAll Ecosystem Grant** supports a team of school divisions and industry in the Gateway Economic Development region to develop a strategic plan for computer science education.
- **Project GUTS (Growing Up Thinking Scientifically)**. In partnership with Massachusetts Institute of Technology, investigations including computer science in middle school science classrooms. This two-year project is National Science Foundation funded, and supports programs in Richmond City Public Schools.
- **Two national Education Innovation and Research Grants** awarded this fall in Virginia use CodeVA’s training programs as the foundation of their research.
- In partnership with GMU and ODU the **National Science Foundation Computer Science for All Grant** explores implementing computer science at the elementary levels for students with high incidence learning disabilities.

Conclusion and Summary

Despite the unexpected impact of COVID-19, CodeVA’s 2020 summer professional development was successful in its delivery of a breadth of rigorous computer science content to K-12 educators of all grade levels from diverse regions of the Commonwealth of Virginia. CodeVA summer professional development provided support to 1,034 teachers during the reporting period defined in this report, adding to the 1001 participants served during the prior year reporting period. Represented in those numbers are teachers from all eight superintendent regions of the state.

This year’s cohort of teachers received more than 20,000 hours of PD ranging from integrating CS into elementary instruction to implementing year long high-school courses. Respondents rated CodeVA highly on both the content and delivery of materials. Participants also found the training as effective in imparting computer science content knowledge, familiarizing the newly adopted VDOE Computer Science SOLs, and sharing effective, grade-level appropriate teaching strategies. Moving forward, CodeVA is poised to respond to school division requests for training utilizing the cohort model as well as on a more limited scope to tailor customized “off-the-shelf” one-day or multiple-day professional development opportunities.

Parallel to the state-funded training, CodeVA utilizes state, federal and foundation grant awards to develop research and practitioner partnerships with Virginia universities, agencies, and school divisions in order to increase opportunities for teacher professional development and to develop rubrics and resources. These resources will serve as a toolset and foundation for a scaled statewide program. The outcomes of these grant-funded programs are intended to provide the state and school divisions with curricula, resources, and a metrics-driven planning tool to help guide implementation of the computer science K-12 mandate.

While much work remains to be done in support of Computer Science K-12 in the commonwealth, all of these programs which owe their availability and success to state support, collaboration and continued funding, ensure that the state of the Digital Dominion is strong and growing.
The 2019-2020 fiscal year was marked by growth within Eureka Workshop’s programs and partnerships. The 2019 Summer Camp session wrapped up serving 325 students onsite and providing camps with three off-site organizations. Partner programs expanded during the school year allowing Eureka to impact students during their school day. As a part of after-school extracurricular activities, providing workshops through partner organization events and even helping Girl Scout Troops earn a few of their STEM badges. This year, some of our new partners are YMCA, VCU School of Engineering, Girl Scouts, The University of Richmond School of Professional and Continuing Studies, The Home School Hub co-op, and the Henrico Police Athletic League (HPAL). Our continuing programs with St. Michael’s School, Central Montessori, and Tuckahoe Elementary school increased in programs offered.

The additional classes and workshops allowed Eureka to retain more instructors throughout the school year. In addition to handling our new course load, our instructors were also available to maintain and update hardware, create new small workshops and class curricula, and coordinate community outreach. In February, we were able to bring our full-time staff up to six team members and create the part-time position of Office Assistant. All of the newly filled positions were filled by existing part-time staff members.

This Spring, as Covid-19 necessitated, our programs pivoted to an online model. The Eureka team has proven itself invaluable. Instructors have adjusted their curricula for online lessons and created new content that is perhaps more appropriate for distance learning than the material we had prepared for our small student-centered in-person classrooms. Rather than our usual jam packed in-person summer camp offerings, Summer 2020 was held online, serving 130 students. Most classes were held with a fee of $1.

In addition to moving all classes, workshops, camps, and Full Steam Ahead to virtual platforms, two new programs have resulted from this shift. Project Snail Mail and Doodle Jam are unique offerings that have helped Eureka instructors pull our community together in inventive new ways.

**Project Snail Mail**

Project Snail Mail is a packet of unplugged activities, postcards to send to a penpal, and any supplies that students may need to complete the activities. Currently, packs are mailed to six states and reach over 500 students. In June, single activities were formatted for distribution with Richmond Public Schools (RPS) food drops alongside “Creativity Kits” organized by long time partners Oakwood Arts and The Visual Art Center of Richmond. In August, we expanded our partnership with RPS, and Project Snail Mail began regular monthly distribution at all three of their walk up food distribution sites. Project CS Snail Mail intends to make computer science activities accessible to families that may have boundaries to virtual activities. By combining efforts with partner organizations, we are able to distribute over 800 English issues and 400 Spanish issues to families in the greater Richmond metro area. Partners include The Central Virginia Food Bank, RPS, The Lit Limo, and LULAC RVA.

**Doodle Jam**

Doodle Jam is an activity utilizing digital tools to facilitate a live communication line and collaborative drawing space. Each month a guest artist joins in drawing with the students. By setting up prompts and free draw spaces, students can interact with each other and our guest artists through artistic expression. Guest artists include Shannon Wright, illustrator of the graphic novel Twins, and Saxton Moore, award-winning animator and producer. Although this activity is not providing direct computer science education, it provides a needed outlet for expression and camaraderie through technology.
Full STEAM Ahead

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.

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 STEM professions.

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.

The Eureka Workshop Robotics programs have made the most changes in this unprecedented year of change. This year the robotics program has expanded with the assistance of sponsorship from Facebook. The Facebook Robotics League is currently on track developing with our partners at LULAC, HPAL, and the University of Richmond School of Professional and Continuing Studies. New partnerships, time for research, online CAD accessibility, and programming opportunities will enable our Robotics Program to have a meaningful impact upon launch and allow us to support other existing robotics teams. Eureka Workshop Robotics has also built a new relationship with SOVA Innovation Hub to support coaches and students in their FIRST Robotics program. This partnership will be CodeVA’s return to directly supporting a FIRST Robotics program since our involvement in 2015. Additionally, the robotics league is working with VEX Robotics to become an official event partner. Working with VEX will enable CodeVA’s Eureka Workshop to host official events that allow teams to qualify for further competitions. Through these partnerships CodeVA is planning to be a central resource for robotics programs of all platforms and sizes throughout the state.

"The annual Full Steam Ahead conference for middle school girls was a great success. This year 177 girls participated in the virtual event. Scholarships were given to 12% of attendees. A total of 48 professional women presented 33 workshops. Seventeen different volunteers supported both students and presenters. Ruthe Farmer, Chief Evangelist for CSforALL, provided an excellent opening keynote address to kick off a full week of virtual workshops. Activities ranged from learning how soap keeps viruses from spreading to what a day in the life of a Facebook software engineer experiences. Students concluded the week with a fun and inspiring closing address from Miss America 2020: Camille Schrier. On a personal level, I was happy to hear Ms. Schrier’s story and how she has incorporated her love of science into many aspects of her life. She is a fantastic role model for all students interested in any of the elements of STEAM."

Maggie Smith
Director of Children’s Programming, CodeVA

Full STEAM Ahead

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 STEM professions.

33 Workshops Hosted

206 Attendees

43 Scholarships Awarded

Robotics

The Eureka Workshop Robotics programs have made the most changes in this unprecedented year of change. This year the robotics program has expanded with the assistance of sponsorship from Facebook. The Facebook Robotics League is currently on track developing with our partners at LULAC, HPAL, and the University of Richmond School of Professional and Continuing Studies. New partnerships, time for research, online CAD accessibility, and programming opportunities will enable our Robotics Program to have a meaningful impact upon launch and allow us to support other existing robotics teams. Eureka Workshop Robotics has also built a new relationship with SOVA Innovation Hub to support coaches and students in their FIRST Robotics program. This partnership will be CodeVA’s return to directly supporting a FIRST Robotics program since our involvement in 2015. Additionally, the robotics league is working with VEX Robotics to become an official event partner. Working with VEX will enable CodeVA’s Eureka Workshop to host official events that allow teams to qualify for further competitions. Through these partnerships CodeVA is planning to be a central resource for robotics programs of all platforms and sizes throughout the state.
The Freedoms Constellations Project

The result is an incredible mural that lives on the CodeVA building downtown that speaks to youth experience with incarceration. Young artists whose lives have been impacted by the juvenile justice system created a mural illustrating their dreams of a world without juvenile incarceration. Additionally, they wrote poetry and narratives to express their views and thoughts. Our students and instructors enhanced the art piece created by Rise For Youth students with integrated electronics. Their work allows portraits of youth from our city to come to life. The mural takes this interactivity a bit further using Augmented Reality (AR) experiences. Using QR Codes AR software, the audience is surrounded by and immersed in the stories, visions, and dreams captured by the project.

The Eureka Workshop team championed that the Freedom Constellations mural’s technical aspects be accessible for all who wander by. For the team, this meant producing safe, touchless ways to trigger lights and sounds. The audience can interact with the piece both by movement and by accessing the AR through their smartphones. Program Director Maggie Smith is very proud of our students and instructors for recognizing the lack of access to smartphones may be a barrier for our immediate community members. Conceptually this project is a perfect illustration of equitable computer science education in action.

The Freedoms Constellations project is a fantastic example of the quality programming we are learning to offer during the new normal. Combining online learning with socially distanced in-person learning throughout the project resulted in a dynamic educational experience that was hugely rewarding for the students. Eureka Workshop will be using projects like this as a framework to have a meaningful impact on computer science education in our community.

2019/2020 Fiscal Year Statistics

- Eureka classes served 819 Students
- 40% of those students received full Financial Aid
- 14% of students participated in free online classes
- 30% were served at Partner facilities
- 51% of students served through direct offerings (not through partners) were POC or “traditionally underserved”
## Financial Statements

### Revenues

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contributions and Grants</td>
<td>$2,325,523</td>
</tr>
<tr>
<td>Program Service Revenue</td>
<td>$43,513</td>
</tr>
<tr>
<td>Investment Income</td>
<td>$8,045</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$2,377,081</strong></td>
</tr>
</tbody>
</table>

### Expenses

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program Services</td>
<td>$1,054,521</td>
</tr>
<tr>
<td>Management and General</td>
<td>$322,201</td>
</tr>
<tr>
<td>Fundraising</td>
<td>$72,636</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$1,449,358</strong></td>
</tr>
</tbody>
</table>

### Net Assets

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Assets at the Beginning of the Year</td>
<td>$348,860</td>
</tr>
<tr>
<td>Change in Net Assets</td>
<td>$927,723</td>
</tr>
<tr>
<td><strong>Net Assets at the End of the Year</strong></td>
<td><strong>$1,276,583</strong></td>
</tr>
</tbody>
</table>

Data is based on audited financial statements through June 30, 2020, available for review at www.codevirginia.org/financials.

## Board of Directors

### Margaret Mayer
- **Board Chair**
- Discover

### Harold Fitrer
- **Treasurer and Finance Committee Chair**
- Communities in Schools

### Jeff Nelson
- **Secretary**
- Strategic Staffing Solutions

#### Officers

- **Vida Williams**
  - Programs Committee Chair
  - The Axis Partners

- **Jennifer Frayser**
  - Development Committee Chair
  - Solvaria

- **Andreas Addison**
  - Richmond City Councilman

- **Matt Benedetti**
  - Microsoft

- **Jared Cotton**
  - Chesapeake Public Schools

- **Nathan Daugherty**
  - Comcast

- **Stewart Roberson**
  - Moseley Architects

- **Alan Seibert**
  - Salem City Schools

- **Kurt Engleman**
  - Capital One

- **Mat Wisner**
  - Amazon.com

- **Chris Jones**
  - Governance Committee Chair
  - Sands Anderson, P.C.

- **Dan Cornell**
  - Altra Client Services, Inc.

- **Anthony Fung**
  - Tech Entrepreneur and Former Deputy Secretary of Technology

- **Vinnie Schoenfelder**
  - CapTech

- **Joe Dean**
  - CarMax