

VIRGINIA DEPARTMENT OF EDUCATION

Planning Grant Application for a College Partnership Laboratory School

A. GENERAL INFORMATION

1. **Name of Eligible Entity (Planning Grant Applicant):** The Rector and Visitors of the University of Virginia
2. **Authorized Official Representative:** Urmilia Bajaj, Director of Post-Award, Office of Sponsored Programs
3. **Name of Contact Person for Application:** Catherine Thompson, CRA
4. **Telephone:** 434.924.3841
5. **Email:** ospnoa@virginia.edu
6. **Office Telephone Number:** 434.924.4270
7. **Date of Submission:** 12/19/2022
8. **Amount of Funding Requested (\$200,000 maximum):** \$200,000
9. Public institutions of higher education (IHE); public higher education centers, institutes, or authorities; or eligible institutions of higher education as defined in the Tuition Assistance Grant Program, as provided in [§ 23.1-628](#), (eligible entity or entities) may apply for a Virginia Board of Education (Board) College Partnership Laboratory School Planning Grant (Planning Grant).
10. Each Planning Grant Applicant (applicant) seeking a Planning Grant must read and comply with the Instructions for Application for a Planning Grant for a College Partnership Laboratory School (Lab School), which are available on the Virginia Department of Education's (Department) website, and fully complete this Planning Grant Application (application) to be eligible for a Planning Grant.

11. Applications may be submitted, and will be evaluated for Planning Grant awards based on factors set forth herein, on a rolling basis.
- 12. Planning Grant Term: This application is for a one-time Planning Grant, the term for which will not exceed 12 months from the date of any award hereunder.**
13. The completed PDF version of the application and related materials must be sent to labschools@doe.virginia.gov by email. The Department may return or reject proposals that are incomplete.
14. Please contact labschools@doe.virginia.gov by email if there are any questions about the application process.

B. DEFINITIONS

1. **College Partnership Laboratory School:** In accordance with [Item 4-14](#) of the General Assembly’s 2022-2024 Biennium budget, the Code of Virginia § [22.1-349.1](#) is amended and reenacted, and the types of IHE eligible entities to establish Lab Schools are defined as follows:
 - a. "College Partnership Laboratory School" means a public, nonsectarian, nonreligious school in the Commonwealth established by a public institution of higher education; public higher education center, institute, or authority; or an eligible institution, as defined in § [23.1-628](#). Notwithstanding the provisions of § [22.1-349.5](#), a public institution of higher education; a public higher education center, institute, or authority; or an eligible institution, as defined in § [23.1-628](#) may submit an application for formation of a college partnership laboratory school.”
 - b. An “eligible institution” as provided above is an institution of higher education as defined in the Tuition Assistance Grant Program in accordance with § [23.1-628](#).
2. **At-risk student:** As provided in the Code of Virginia § [22.1-349.1](#), "at-risk student" means a student having a physical, emotional, intellectual, socioeconomic, or cultural risk factor, as defined in Board criteria, that research indicates may negatively influence educational success.

For the purpose of these guidelines and any Planning Grant awards, “at-risk students” include (a) students who have experienced learning loss as the result of the COVID-19

pandemic; (b) students served by low-performing schools that are designated as “accredited with conditions” or “accreditation denied” based on the Virginia Board of Education’s accreditation ratings; and (c) students attending schools identified under the Every Student Succeeds Act within three support categories: (i) Comprehensive Support and Improvement, (ii) Targeted Support and Improvement, or (iii) Additional Targeted Support Category.

3. **Regional diversity:** For the purpose of evaluation of this application, regional diversity reflects representation from each of the Department’s eight Superintendent [regions](#).

C. ASSURANCES AND SIGNATURES

1. ASSURANCES

- a. By signing and submitting this application, the applicant assures that it will adhere to state and federal laws and regulations governing public schools, including the *Virginia Standards of Quality*, the *Virginia Standards of Learning*, and the Board’s *Regulations Establishing Standards for Accrediting Public Schools in Virginia*.
- b. The applicant assures that all elements of the proposed school(s) will comport with all applicable state and federal laws and regulations.
- c. The applicant certifies that to the best of his/her knowledge the information in the application is correct, that all application elements have been addressed as required in this application, and that the applicant understands and will comply with the assurances.
- d. The applicant agrees to conduct a review of their planning phase, and submit milestones and deliverables as required, including, but not limited to, a comprehensive report with details for the projected Lab School implementation, expenses, and other items as may be prescribed by the Department.
- e. Applicants receiving a Planning Grant are expected, by the end of the term of such grant, to submit a subsequent application for the launch of a Lab School to the Department, for review and approval by the Board.
- f. Applicant provides assurance to subscribe to the following reporting requirements timetable:

| TIMELINE | BENCHMARK AND DELIVERABLES |
|---|--|
| On or before the end of the first quarter of the grant term | Awardee must present a proposed list of milestones, measures of success, and deliverables. |

| | |
|--|--|
| On or before the end of the second quarter of the grant term | Awardee must submit a progress report in order to be eligible for the second installment of the award. |
| On or before the end of the third quarter of the grant term | Awardee must present progress on milestones and deliverables, including submission to the Board of an application for approval to launch a Lab School. |
| On or before the end of the grant term | Awardee is expected to have attained approval by the Board to launch a Lab School. |

2. SIGNATURES

- a. Higher Education Authorization:
Signature of [AUTHORIZED REPRESENTATIVE of public institution of higher education; public higher education center, institute, or authority; or an eligible institution]:

Printed Name: Catherine Thompson, CRA
Title: Assistant Director of Research Administration – Pre-Award
Date: 12/19/2022

- b. Fiscal Agent Authorization (if applicable):
Signature of Division Superintendent of Fiscal Agent School Division:

Printed Name: Click or tap here to enter text.
Title: Click or tap here to enter text.
Date: Click or tap here to enter text.

- c. Signature of Chairman of School Board of Fiscal Agent:

Printed Name: Click or tap here to enter text.
Title: Click or tap here to enter text.
Date: Click or tap here to enter text.

D. REGIONAL AND APPLICANT DIVERSITY

1. Planning Grants will be awarded in a manner that encourages ready access to Lab School options and the establishment of Lab Schools in each of the Department's [eight Superintendent regions](#).
2. Indicate Proposed Name(s) of Lab School: **The University of Virginia Buford Lab School**
3. Identify Proposed Physical Location(s) of Lab School: **Buford Middle School, 1000 Cherry Avenue, Charlottesville, VA 22903.**

E. PROGRAM DESCRIPTION, GOAL, AND TIMELINE

1. PROGRAM DESCRIPTION

- a. General description of the program (*2-3 paragraphs maximum*):

The proposed lab school between the Charlottesville City Schools (CCS) Division and the University of Virginia (UVA) leverages UVA's expertise in positive youth development, science, technology, engineering, mathematics, and computer science (STEM+CS) education, and teacher education to empower students to use and create computing technologies to solve relevant, authentic, and community-based problems. The UVA Buford Lab School (BLS) brings together the Teacher Education program at the School of Education and Human Development, The UVA Equity Center, The UVA Center to Promote Effective Youth Development, the Department of Computer Science, and the School of Data Science to focus on transforming teaching and learning by breaking down the walls between the school and the outside world. The lab school will help middle school students develop technical skills for future workforce success by solving real-world and community-based problems with computational tools. BLS will also support and develop teacher leaders who understand student and community assets and can leverage and sustain these resources within project-based, student-led, and computing-rich projects.

The Lab School will be founded on three guiding principles to improve student outcomes: developing a community of practice around education that incorporates interdisciplinary, project-based, computing-rich learning experiences; engaging students by incorporating their voices and choices throughout the learning process; and making meaningful community connections to engage students, teachers, and parents in real-world problem solving, mentorship, and career explorations. BLS views computer science (CS) and data science education as an important catalyst to engage students in personally meaningful, experiential, and interdisciplinary learning experiences that deepen content-area understanding (e.g., K-12 CS Framework, 2017). For example, students can explore how to provide wheelchair-accessible sidewalks to their own neighborhoods by using real datasets provided by the city,

addressing social studies, science, and CS VA Standards of Learning, while simultaneously helping students develop critical computing and data science skills. By transforming classrooms into places where students engage in personally relevant and computationally-rich interdisciplinary problem solving, the lab school also serves as a center for transformative professional development experiences. BLS will tightly partner with UVA's top-ranked secondary teacher education program to bring together teacher candidates, teacher educators, current teachers, and school leaders to create and apply innovative approaches to teaching and learning. Moreover, BLS leverages UVA's strong educational research expertise not only to bring evidence-based principles to the school but also to communicate and disseminate the work across the Commonwealth, nationally, and internationally.

The planning grant will enable CCS and UVA to build on existing collaborations to pilot this approach and develop systems and infrastructure to scale to the whole middle school in a full lab school proposal. We will bring together various resources and expertise from CCS and UVA, including the UVA Equity Center's Starr Hill Pathways (SHP) program, the Remaking Middle School (RMS) and the Youth-Nex Young Women Leadership Programs, the School of Data Science, and the School of Engineering and Department of Computer Science. The planning grant will also leverage existing partnerships with local community organizations such as the Boys and Girls Club of Central Virginia, whose Cherry Avenue Club is co-located at Buford Middle School, and C4K, a local nonprofit that provides technology-based mentoring to middle school youth. The planning grant will also involve Piedmont Virginia Community College (PVCC), a nonresidential two-year institution that serves the Central Virginia area with many technical degrees and certificates. Given the rich history of collaboration between CCS and UVA and local organizations, this lab school is a natural next step and will provide a state and national model for how communities, school divisions, research universities, and teacher education programs can provide innovative and equitable learning experiences to improve student outcomes for middle school youth.

b. Rationale for the program (*2-3 paragraphs maximum*):

Research science has increasingly identified early to mid-adolescence – youth aged 10-15 in grades 4-9 – as the most consequential developmental period outside early childhood. Yet, middle school years are the most under-addressed segment along the pre-K through post-secondary continuum despite the evidence showing adolescence is a substantive period of development and critical inflection point for subsequent academic performance and social and emotional well-being. Improving the quality of the middle school experience, especially for underrepresented youth, can significantly shift the educational trajectory for those students who are most at-risk. The lab school is committed to transforming the school experience in a way that elevates the developmental needs of young adolescents: a sense of belonging and purpose, positive identity development, agency and leadership, positive social interactions and relationships, goal setting and achievement, flexible problem-solving and critical

thinking, as well as opportunities for autonomy and self-direction, and supporting mental health.

In parallel, Virginia has made a strong push to integrate CS in middle school classrooms (e.g., Virginia Board of Education, 2017; 2022a). Although the CS SOLs were approved in 2017, only 7.8% of divisions currently report implementation (Atkins, 2022). The top barriers to realizing the CS SOLs identified by school districts in Virginia include: 1) lack of instructional time; 2) lack of educator knowledge about CS; 3) lack of curriculum resources; and 4) a lack of endorsed CS teachers in 6-8. Needs also include increasing collaboration with institutions of higher education to develop research-based K-8 instructional resources, providing professional learning experiences to support educators pursuing CS endorsement, and expanding professional learning opportunities (Atkins, 2022).

By transforming school experiences into student-driven, computationally rich, community- and design-based projects, our lab school aims to elevate the voice and agency of middle school students in ways that align with research-based practices for positive youth development and asset-based pedagogy (Ryoo et al., 2013). This approach addresses current high-priority needs at Buford Middle School: (1) improving student performance on state assessments; (2) increasing student engagement in school, including connecting students to experiences outside the classroom; and 3) professional development to help teachers connect different content areas in a way that is relevant to and builds on assets of their students. By engaging students, teachers, parents, teacher educators, and educational researchers together around developing authentic community problems to address in the lab school, we aim to address Buford's current pressing needs while creating sustainable and effective systems for student and teacher learning. This lab school planning proposal also comes at an opportune time as Buford Middle school has already begun transformation of the physical buildings that will complete at the same time as the planned opening of the lab school (2024-2025), and planned offerings of career-based courses in the 2023-2024 school year.

- c. Nature of innovation proposed for the program, including how it will improve student academic proficiency, mastery, college and career readiness, and long-term outcome goal (2-3 paragraphs maximum):

Keisha walks a mile to school because there is a bus driver shortage at CCS. She notices that on some of the smaller streets the sidewalks are not as well maintained as on the larger streets. She often must walk in other people's yards and try to stay away from cars. She brings this back to her daily project cohort meeting at school and learns that many other of her peers share this same problem. With the support of their teachers, the group ideates a variety of approaches to address this problem – researching traffic patterns during school commutes, investigating ways to make pedestrians more visible, and researching city policies on how sidewalks get created and maintained. They decide to ask community experts to come into their project meetings to help provide relevant information and data and then go out to the different walking paths as a project team to explore the context. Working together

with community leaders and experts, students decide to decompose this larger problem into smaller sub-problems, and work in groups to address specific tasks of their choosing. Some students choose to create a presentation to the community about investing in safer sidewalks, including costs, benefits, and challenges. Other students choose to create an app where students can annotate walking paths around the school with relevant information from their friends and peers. Another group decides to create their own Lab School walking vest that lights up in sync with music that they play while walking to and from school.

The core of this lab school is providing these kinds of transformative and research-based effective learning experiences for students and teachers grounded in authentic, community-based, and computing-rich projects. Creating a lab school without traditional bell schedules or isolated content-based classes transforms learning environments into places where students have agency and voice to pursue questions and problems of consequence to their lives. Within these projects, students have hands-on experiences with specific content objectives to concretize and motivate in-depth learning. Breaking down the walls of content classes enables the lab school to put together innovative interdisciplinary approaches that address VA SOLs across domains. For example, to create a presentation to the community about sidewalk use, students would need to engage in a variety of research approaches (English 8.9), ask questions, define problems, plan and carry out investigations (Science PS.1), be able to solve area and perimeter problems (Mathematics 8.10) with graphs of data (Mathematics 8.12 and 8.13), understand how public policy is made at the local level (Civics CE.10), evaluate how civic and social duties address community needs and serve the public good (Civics CE.3), use interview techniques to gather information (English 8.1) and develop oral presentations (English 8.2). In this way, students create customized learning trajectories of standards-based content that are rooted in their own experiences and interests.

Research overwhelmingly demonstrates that learning experiences that are relevant and meaningful to students result in durable student understanding of content and skills (National Research Council, 2000; 2018). Students engaged in authentic, interdisciplinary project-based work that integrates content understanding with disciplinary practices see increases in student learning outcomes. Moreover, learning that builds on students' assets and resources helps students feel valued and empowered in classroom settings. The emphasis on computing and data science skills will help prepare students to be college and career ready, and the collaborations with experts at the University and community members will enable students to be exposed to a range of careers. Long-term outcome goals include increased student performance on state standardized tests, increased teacher retention, reduced student absenteeism, and increased awareness of different careers.

d. Expected student learning benefits (*2-3 paragraphs maximum*):

We expect that through these rich, design-based learning experiences the lab school will see increased numbers of students achieving proficiency on disciplinary state

standardized tests (see Section 2: Relevant Research). Building upon the assessment expertise in the School of Education and Human Development, we will create tailored interdisciplinary performance assessments to provide students with clear benchmarks of success as well as data for teachers and researchers about the kinds of skills and understandings that students develop. In this way, for students to complete their projects they must understand the relevant disciplinary content. For example, for students to present a prototype of a vest that lights up, students will necessarily need to understand and explain the basics of electricity (VA PS.9). By providing rich formative feedback to students during the projects and opportunities to learn content through applied and customized pathways, we expect students to increase performance on disciplinary VA state tests.

By engaging the students in the design of their own school experiences that emphasize authentic and relevant interdisciplinary projects, we expect students to have increased agency and engagement in school. This model supports middle school students by: (1) empowering students to co-develop curricular materials with their teachers; (2) providing meaningful and relevant opportunities for them to learn content and computational skills; and (3) explicitly privileging and sustaining students' cultures and identities in classroom settings. Indicators of increased engagement in the lab school will include decreased absenteeism, a current area of need for Buford Middle school.

By focusing on integrating CS and data science into core content areas, we expect students to develop critical workforce skills. Work-based learning provides an excellent opportunity to learn about a specific career and workplace norms and expectations. Students who participate in these programs are often students who need support with motivation and direction to move forward. Strengthening academic learning and practicing relevance to the world of work helps bolster student persistence and successful completion of education and training. Co-ops, work-based courses, and apprenticeships intentionally integrate work-based learning into classroom learning. Students receive much needed encouragement and support from mentors in the workplace. In addition, by engaging with a variety of content-area experts as mentors to these projects, we expect students to have increased workforce awareness of a variety of different careers and career paths. We also predict that through these hands-on experiences students will not only be aware of different career paths but also be able to see themselves in those positions. We will assess student career awareness through surveys and interviews at the end of each semester.

e. Expected teacher learning and professional development benefits (*2-3 paragraphs maximum*):

These kinds of transformational lab school student experiences require outstanding teachers to co-create and facilitate these projects. The lab school will create an innovative professional learning environment that extends into the community and provides a model for pre-service and in-service teacher education. The lab school will work to value and privilege the expertise and assets of current teachers while also providing space, time, and resources for teachers to be able to co-create innovative

curricular experiences with their students. Students, teachers, teacher candidates, community members, and experts will all collaborate in a BLS Curriculum Design Accelerator where interdisciplinary teams deepen their knowledge of young adolescent development, specific content area understanding including CS and data science skills, and research-based pedagogical practices. Teams will identify a vision for their shared projects, and together design and pilot innovative school experiences to make that vision a reality and sustainable within the community. In this way, students have a voice in their school experience and work together with teachers, community members, and experts to create student-driven learning experiences.

This lab school planning grant will prototype the BLS Curriculum Design Accelerator leveraging the Starr Hill Pathways (SHP) program infrastructure from the Equity Center at UVA, an organization focused on authentic community collaboration, fair treatment of community experts, and modeling and teaching community-based scholarship. SHP currently works with middle and high school youth in local districts for a three-week summer experience, involving many UVA departments as well as youth-serving community partners that align directly with specific career pathways identified in the Commonwealth of Virginia. The lab school planning year will involve specific cohorts of existing Buford students with Buford teachers and EHD pre-service teachers engaging in a similar experience to SHP, where teachers and students work together with community partners on projects during the summer. In this prototype of the BLS Curriculum Design Accelerator, students and teachers will work together on solving locally relevant problems using actual datasets (e.g., CodeforCharlottesville) to develop and test potential solutions. In doing so, teachers will gain critical computing and data science skills learning alongside their students. The second part of the Curriculum Design Accelerator will have the same groups co-develop similar project-based, computing-rich curricula to be implemented during the 2023-2024 school year in their classrooms. By engaging in this lab school professional development model, we aim to help existing teachers: (1) incorporate relevant and authentic classroom experiences for their students; (2) integrate computationally-rich activities that address VA CS SOLs and content standards; and (3) leverage and sustain student and community assets in their classrooms. This model supports the development of pre-service teachers by: (1) embedding them in rich professional learning experiences that are grounded in student and community contexts; (2) providing opportunities to learn and apply research-based effective pedagogical strategies with novel, computationally-rich practices; and (3) providing explicit opportunities to co-develop classroom materials that privilege and sustain students' funds of knowledge.

The Lab School will also provide wrap-around professional learning experiences for teachers to support their development and use of interdisciplinary, project-based, and computationally-rich projects. Educational researchers at UVA will provide mentoring, formative feedback, and evaluation of the lab school facilitated through an instructional coach who will be located at the school.

f. Content areas addressed:

The Lab School will engage all content areas to reshape traditional, siloed disciplinary approaches into interdisciplinary project-based learning experiences by unbundling the VA SOLs as discussed above. The lab school will also use these new combinations of SOLs to find how to integrate CS SOLs. For example, in social studies, computational techniques can help students use rich datasets to find patterns and conduct inquiry in historical and present-day contexts. For science, computation can be thought of as a third pillar alongside theory and experiment to develop ways to understand the natural environment and create novel solutions and technologies. CS concepts and skills can also be used in language arts through digital storytelling, creative writing, and to help students conduct textual analysis. In this kind of integrated CS approach, meaningful use of CS in content areas can help unlock powerful student-driven, interdisciplinary, inquiry-based learning. Moreover, integrating CS into core content areas can help ensure that all students have opportunities to engage in CS, not just the ones who self-select into stand-alone CS electives. Thus, integrating CS into core content in middle school settings is a critical and crucial way to provide critical workforce skills to all students.

The planning grant will enable the team to pilot this approach first with a small subset of in-service and pre-service teachers for the planning year while also developing systems to extend to the whole school student population for the full lab school proposal.

2. GOAL

State the overall proposed goal for the program:

Goal 1. Transform teaching and learning by breaking down the walls between the school and the outside world so that students and teachers have agency to connect with community-based partners to learn about career pathways, receive mentoring, and partner around solving real-world problems facing the community. As a result of the lab school, we hope to see student outcomes of increased performance on state standardized tests, decreased absenteeism, and increased awareness of careers.

Goal 2. Develop a model for the state and nation for the integration of CS into core content through innovative pedagogy and curricula. The lab school will work together with community members, industry experts, students, and teachers to co-create integrated CS curricula from a community-oriented perspective that is connected to students' lived experiences (Chiu et al., 2021; Yadav & Heath, 2022). These SOL-aligned interdisciplinary projects will be shared on #GoOpenVA. The lab school will also develop performance assessments that can inform how the state can evaluate student achievement of integrated CS standards.

Goal 3. Develop a model for the state and nation for teacher education pathways that provide powerful learning experiences for pre-service and in-service teachers, including potential approaches for a K-8 CS endorsement and teachers across endorsements gaining knowledge and skills to integrate computing into their practice.

3. TIMELINE

Provide a timeline of the planning process, including the proposed date/school year for launch of a Lab School:

We plan to use the planning year to hire a lab school liaison, engage partners and collaborators, and implement the Lab School pilot with a select group of teachers, students, and community members (Table 1). The Lab School liaison’s primary focus will be to serve as a connector between CCS and UVA, facilitating all lab school activities for the planning year, and will be jointly hired by CCS and UVA.

We will submit quarterly progress reports and present findings to VDOE regularly. We hope to have preliminary data from the pilot implementation to accompany the full Lab School proposal in the third quarter of the planning period. We will continue to work with the pilot team throughout the 2023-2024 school year to implement Lab School projects, provide instructional coaching, and conduct research and evaluation of the Lab School. We aim to launch the full lab school in the 2024-2025 school year.

Table 1. Timeline for planning grant activities.

| Objectives | Q1 Dec- Feb | Q2 Mar- May | Q3 June- Aug | Q4 Sept- Nov |
|--|----------------------------|----------------------------|-----------------------------|-----------------------------|
| Hire Lab School Liaison | | | | |
| Engage partners and collaborators | | | | |
| Bi-weekly meetings with Lab School Advisory Team | | | | |
| Present proposed list of milestones, measures of success, and deliverables to VDOE | | | | |
| Finalize Pilot Program Plan for Summer 2022 | | | | |
| Submit progress report to VDOE | | | | |
| Launch Lab School Pilot (Curriculum Design Bootcamp and school-year implementation and coaching) | | | | |
| Present progress and milestones to VDOE | | | | |
| Review Lab School pilot and make refinements as needed | | | | |
| Submit Full Lab School Application to VDOE | | | | |
| Obtain approval by VDOE to launch a Lab school in 2024-2025. | | | | |
| Implementation support and instructional coaching of Lab School projects during the school year. | | | | |
| Research and evaluation of the Lab School activities | | | | |

F. STUDENT POPULATION AND RELEVANT RESEARCH

1. TARGETED STUDENT POPULATION

- a. Describe the student population and discuss why they are proposed. Include the number of students, reporting group(s), and grade level(s):

The Lab School will serve all Buford Middle School students. Buford Middle School served 277 7th and 322 8th grade students in the 2021-22 school year (Virginia Department of Education, 2022b). Fall membership by subgroup reported for 2021 included students classified by the division as: 36.9% Black, 33.1 White, 14.7% Hispanic, 10.2% Multiple races, and 5.2% Asian, 59.8% qualified for free and/or reduced lunch, 19.2% Emerging Bilinguals, and 16% Students with Disabilities. In the 2021-22 school year, the school experienced chronic absenteeism (24.2%).

| GRADES TO BE SERVED FOR THE FULL TERM OF THE APPROVED LAB SCHOOL CONTRACT (PLEASE CHECK ALL THAT APPLY*) | | | |
|--|--|----------------|---|
| Pre-K | | Sixth Grade | |
| Kindergarten | | Seventh Grade | X |
| First Grade | | Eighth Grade | X |
| Second Grade | | Ninth Grade | |
| Third Grade | | Tenth Grade | |
| Fourth Grade | | Eleventh Grade | |
| Fifth Grade | | Twelfth Grade | |

*If the applicant intends to add or change grade levels at some point during the Lab School’s operation, please provide this information in the education program section of the narrative.

- b. Describe the community(ies) the school(s) serves:

Charlottesville, Virginia is the heart of the Charlottesville metropolitan area which includes Albemarle, Buckingham, Fluvanna, Greene, and Nelson counties. In 2020, Charlottesville, VA had a population of 46,553 people with a median age of 32.3 and a median household income of \$59,598 (United States Census Bureau, 2021). The 5 largest ethnic groups in Charlottesville are White (Non-Hispanic; 65.6%), Black or African American (Non-Hispanic; 18.5%), Asian

(Non-Hispanic; 7.02%), White (Hispanic; 4.39%), and Two or more ethnicities (Non-Hispanic; 2.77%). As of 2020, 11.3% of Charlottesville residents were born outside of the United States, and 23.1% of the population live below the poverty line, which is higher than the national average of 12.8%.

- c. If the Lab School is going to have a specialized focus (e.g., Science, Technology, Engineering, Mathematics [STEM], at-risk students, special education, career and technical education, gifted education, classical education, etc.), please describe the focus:

Buford's current school accreditation rating is Accredited with Conditions. Academic achievement in Science is Level Three (below the state standard), English is Level Two (near the state standard or sufficient improvement) and Mathematics is Level One (meets or exceeds state standard or sufficient improvement). Differences in achievement by student sub-groups are Level Three for English and Mathematics.

The lab school aims to improve the current school accreditation by providing interdisciplinary, project-based, and computationally-rich experiences for middle school students accompanied by rich mentoring and career experiences. CS plays a critical role in our daily lives yet is rarely taught in middle school settings. A deeper understanding of the fundamentals of computing enables students to take control of how technologies will affect their lives, their culture, and their future, which extends to all content areas (e.g., VA CS SOLs). Opportunities to learn CS empowers students to become creators, not just consumers, of the next wave of technological advances and discoveries (Wing, 2008). Given that technical knowledge is the backbone of many crucial aspects of today's society (e.g., job creation, fair voting, communication networks, advancing scientific discovery), who does and does not have access to this knowledge as well as who is at the table to create these technologies is a social justice issue (Margolis et al., 2012). Moreover, careers in computing and technical fields pay almost double those of other fields (Bureau of Labor Statistics, 2018). The Lab School will focus on providing these kinds of integrated CS experiences for all students in ways that help promote deep core content area understanding as well as positive youth development by focusing on projects and problems that are of personal and community relevance.

2. **RELEVANT RESEARCH**

Discuss any relevant research tied to the proposed student population and overall goal of the program to demonstrate that it will improve student academic proficiency, mastery, college and career readiness, and long-term outcomes:

Research across different educational disciplines and domains underscores the importance of school environments that: actively engage students in learning; connect to the local community with involvement from parents and guardians; provide personalized learning in spaces that are physically and emotionally safe; challenge each student to reach their full potential; and prepare students for success in college

or future employment in the global workforce (Lewallen et al., 2015). For example, a recent consensus report published by the National Academies that summarized decades of research on how people learn emphasized the effect of learners' social and cultural contexts on individual brain development and how school environments should: (1) engage the learner to direct their own learning through setting goals and challenges that are personally meaningful; (2) use asset-based approaches that support all learners to connect out-of-school experiences and build upon learners' prior knowledge, interests, and experiences in their social and cultural contexts; and (3) purposefully engaging students in disciplinary practices to help students develop a deep understanding of subject areas instead of rote memorization of concepts (National Academies of Science, Engineering, and Medicine, 2018).

In particular, the middle school years are a crucial period of adolescent development, with neuroscience demonstrating the most changes in the brain occurring outside of early childhood (Blakemore & Choudhury, 2006). Middle school is also a critical inflection point for subsequent academic performance and social and emotional well-being (Nagaoka et al., 2015). Young adolescents need to feel autonomy, competence, and belonging in educational settings to succeed. Middle schoolers need agency and ownership over their learning goals and activities to reach those goals and develop crucial metacognitive and self-regulating strategies. Young adolescents also need opportunities to develop a growth mindset to feel academically competent, especially given the focus on peers and peer standing at that age. Middle schoolers also need strong student-student, student-teacher, and student-community relationships to feel as if they belong at school, and moreover, instructional approaches that center student identity development in the content areas so that students feel belonging in various disciplines (e.g., students can see themselves as scientists or programmers).

Although decades of research have overwhelmingly shown these effective ways to support learners, and in particular middle school students, school structures and institutions are still largely based on industrial and behaviorist models with specific bell schedules, isolated content-area teaching, and teacher-centered learning. Current national and Virginia educational policy contexts, however, provide potential opportunities to create new models of research-based teaching and learning that align with the needs of early adolescents. For example, national standards emphasize these kinds of deeper learning approaches (e.g., Huberman, Bitter, Anthony, & O'Day, 2014), including the Common Core State Standards, the Next Generation Science Standards, the College, Career, and Civic Life (C3) Framework for Social Studies State Standards, and the Virginia State Standards of Learning.

Student-centered, project- and community-based, interdisciplinary instructional approaches provide opportunities for middle school students to exert autonomy, develop competence, and create a sense of belonging in a classroom. Project-based approaches enable students to ask their own questions or define their own problems and set their own goals and plan to answer those questions and problems. Inherent in project-based approaches are multiple opportunities for iterative development and feedback, aligning with approaches to foster a growth mindset. Project-based learning

often relies on students working in teams, providing opportunities for students to develop crucial interpersonal skills and connection to their peers. When connected to community- and place-based approaches, project-based learning enables students to leverage and sustain their own assets and community resources in school. Working on authentic problems with the help of industry experts helps students see themselves in these domains and roles.

Various studies demonstrate the benefit of project-based instruction at a variety of levels and its effects on student achievement (Barron et al., 1998; Blumenfeld et al., 1991; Hmelo-Silver et al., 2007; Kolodner et al., 2003). For example, the *Study of Deeper Learning: Opportunities and Outcomes* compared high schools that engendered this kind of rich project-based approach to similar schools with traditional approaches (Zeiser et al., 2014). Results demonstrated that students in schools that explicitly focused on these deeper learning outcomes outperformed traditional schools on international assessments of core content knowledge (reading, mathematics, and science) and earned higher scores on state English Language Arts (ELA) and mathematics tests than students at traditional schools. Project-based schools reported higher student levels of collaboration skills, academic engagement, motivation to learn, and self-efficacy. Moreover, students from the project-based schools were more likely to graduate from high school on time than students in traditional schools. Similarly, Chiu et al. (2013) demonstrated that seventh graders engaged in community-based, interdisciplinary projects outperformed peers on state-standardized mathematics tests with large effect sizes.

This lab school proposal uses an integrated CS focus to help transform school experiences from teacher-led to student-centered, project-based approaches. Because middle school teachers typically have little experience with CS, with integrated CS projects they are often learning alongside students, switching the “sage-on-the-stage” to a collaborative student-centered classroom (e.g., Goode et al., 2014). Prior research on specific teaching strategies for high-quality, equitable CS instruction also align with effective teaching strategies for project-based learning and middle school youth which include: (1) setting high standards and engaging in practice-based instruction; (2) building upon students’ funds of knowledge, and (3) facilitating a culture of caring (Margolis et al., 2012). *Holding high standards for students within practice-based instruction* involves shifting from a teacher-led transmission model of teaching to a practice-based instruction where students help define the questions to investigate (e.g., Windschitl & Calabrese Barton, 2016). Allowing students to define their own questions and direction in these activities allows students to *build upon their funds of knowledge*, using how they interpret and are situated within the world as a framework for learning (e.g., González, 2006). Teachers can use these student-generated ideas as starting points for CS projects (e.g., Ryoo et al. 2020). Project-based and student-centered instruction can also help students see the relevance of CS in their lives and holding high standards for students within these activities can combat perceptions of who is able to do computing by encouraging all students to achieve during computationally-rich activities (e.g., Milesi et al., 2017). Project-based CS instruction

differs from other pedagogies which can unintentionally promote stereotypes of who can or cannot succeed in computing (Margolis et al., 2008).

G. COLLABORATION AND STAKEHOLDER INVOLVEMENT

1. Describe the involvement of local school divisions, community-based organizations, employers, teachers, and parents in the planning, development, and implementation of the proposed program:

The UVA SEHD has worked together in close collaboration with Charlottesville City Schools through a planning grant team that has included the CCS Superintendent, Chief Academic Officer, Principal of Buford Middle School, CCS Instructional Coaches, and Buford Middle School teachers. We will extend the planning grant to include additional teachers, BMS students, and parent members from Charlottesville City Schools community on the lab school advisory team. We aim for these stakeholders to have a strong presence in the design of the final lab school proposal and feedback on the planning year pilot activities through biweekly meetings throughout the planning year.

We also bring together local community-based organizations in the planning, development, and implementation of the proposed program. We have worked in close collaboration on this planning grant with the founder of Tech-Girls and Charlottesville Women in Tech, both organizations that work to provide career awareness and opportunities for technical fields. We will extend during the planning year to work together with Piedmont Virginia Community College (PVCC) to identify potential pathways for career and technical opportunities. We also leverage partnerships with local youth mentoring programs such as C4K, a local organization that offers a community makerspace for project-based learning with 1:1 mentoring and access to professionals and organizations, as well as the Boys and Girls Club of Central Virginia which has collaborated with UVA on a variety of STEM and CS afterschool programs.

2. If the Lab School is going to be in partnership with a local school division(s), please describe the partnership briefly:

The partnership between UVA and Charlottesville City Schools Division for the Lab School builds on an extensive and rich history of collaborations, including the following in recent years:

- The [Lab School for Advanced Manufacturing Technologies](#) helped teachers to integrate engineering and technical expertise into Buford Middle School, working closely with both the School of Education and Human Development and the Engineering School at UVA.
- The [iSTEM initiative](#) at CCS, started in 2016 in collaboration with UVA, provides integrated STEM and design activities for all students throughout the division. The iSTEM facilitators teach student-driven, inquiry- and project-based activities with elementary, middle, and high school classes as well as lead PD and coaching around STEM and integrated CS throughout the district.

- The [Charlottesville Computer Science Community](#) is a partnership among UVA, CCS, C4K and other local nonprofits to help bring integrated computing activities into classrooms through student and teacher workshops. Since 2019, the CCSC has been funded through a Virginia State Department of Education Advancing Computer Science Grant and has worked with three cohorts of K-8 teachers from CCS to integrate CS into their classrooms (Wilkens et al., 2021).
- [The Equity Center](#), an organization focused on authentic community collaboration, fair treatment of community experts, and modeling and teaching students community-based scholarship for social change. The Starr Hill Pathways program already serves many Buford middle school students in a three-week summer experience, working with many UVA departments as well as youth-serving community partners. Students explore community assets through field trips and career-related projects with the help of SHP staff and volunteers. During the school year, SHP youth receive academic enrichment, mentoring support, and skill-building workshops.
- The [Young Women’s Leadership Program](#) at UVA works with local middle schools to pair 7th and 8th grade girls with UVA undergraduate mentors. Over a decade of research demonstrates the success of the program for both the mentees and the mentors, including outcomes such as social and relational skills, self-regulation, and self-awareness and understanding (e.g., Deutsch et al., 2017).

H. SUSTAINABILITY

1. The goal of the Planning Grant program is to support public institutions of higher education; public higher education centers, institutes, or authorities; or eligible institutions of higher education as defined in the Tuition Assistance Grant Program, as defined in § 23.1-628, as they develop and implement programs in order to create or improve capacity to operate and sustain a Lab School independently of long-term state funding, and in a manner that promotes quality, innovation, and program results.
2. Please describe the capacity of your public institution of higher education; public higher education center, institute, or authority; or eligible institution to implement a Lab School:

At UVA, the Lab School proposal brings together expertise and capacity from a variety of centers and programs to be able to implement our Lab School. The Lab School effort is led by the Dean of the School of Education and Human Development (EHD), in close collaboration with the Director of Teacher Education and the Chair of the Department of Curriculum, Instruction, and Special Education. UVA’s EHD and Teacher Education Program are consistently rated at the top nationally for a variety of programs, including Secondary Education and Educational Leadership. The Teacher Education Program works diligently to prepare teachers who exemplify best practices in connecting content, practice, and research to foster academic, social, and emotional development in students with diverse backgrounds and diverse needs and has a long history of working in close collaboration with local school districts to encourage both in-service and pre-service teacher learning. The lab school leverages the strong infrastructure of the teacher

education program, including curriculum and instruction expertise, management of outreach and partnerships, offering and connecting to professional development opportunities, and development of teacher education pathways for interdisciplinary and CS approaches. The lab school will also benefit from the engagement of teacher education candidates to reduce student-teacher ratios. Additionally, UVA will also bring the strong expertise from the Educational Leadership program to support the Lab School Leaders.

This lab school also leverages capacity from various centers at UVA and schools outside of EHD such as the UVA Center to Promote Effective Youth Development with the Remaking Middle School project. The lab school will work with these experts who have worked over the past five years with school districts to re-envision middle school. As noted previously, The Equity Center at UVA and the Starr Hill Pathways Program will provide infrastructure for the pilot year. The lab school will also involve the School of Data Science at UVA through the Collaboratory for the Advancement of Education and Data Science, and the School of Engineering and Department of Computer Science through the Director of the Center for Innovation in Computing Education and Outreach. Partners at EHD already have strong and extended collaborations with these schools. In short, UVA provides a wealth of resources that the lab school will use for the planning, implementation, and evaluation of the work.

3. Identify potential affiliates, partners, and describe potential sustainable funding sources:

Given the diversity and strengths of existing collaborations, we will devote much of the lab school planning year to organizing and coordinating among our existing partners of CCS, UVA, PVCC, the Boys and Girls Club of Central Virginia, and C4K. However, during the planning grant we will use our existing UVA and community partners to strengthen connections to local industry partners (e.g., WillowTree, Capital One, Apex Energy) to bring additional expertise, resources, and experiences to the lab school.

For additional potential funding sources, both the Collaboratory for the Advancement of Education and Data Science and the Center for Innovation in Computing Education and Outreach have K-12 outreach funding. The project team will also leverage the strong federal and foundation grant funding track record of the team to pursue additional extramural funding.

Sustainable funding sources also include in-kind donations of UVA faculty, staff, and student time, including salary and course buyouts for faculty time and one full-time graduate research assistant. UVA has also promised matching funds to the lab school for funds brought into The Equity Center.

4. Identify potential barriers to the planning process and possible ways to address them:

The most significant barrier we have identified to the planning process is the additional workload on CCS district administrators and teachers. Working with CCS leadership and

the Buford Principal we have identified potential ways to address this challenge by UVA leading much of the logistical work of the Lab School and by providing support to teachers through generous stipends and additional incentives such as professional development credits.

I. BUDGET OF DIRECT COSTS (WITH \$200,000 MAXIMUM)

1. Complete the budget table below outlining the financial plan of how the Planning Grant will be used in the effort to establish a Lab School. The Planning Grant period and use of funds may not exceed 12 months from the date of award.
2. Only include direct operating costs. Indirect costs and capital outlay costs are not allowed. Include a description of expenses that explains appropriateness of expenses based on the category descriptions shown below.
3. All expenses must be directly related to the proposed Planning Grant activities. Applicants are not guaranteed the requested award amount and any award may be proportionally adjusted according to application’s weighted Planning Grant Application Evaluation Rubric score and to reflect only those expenditures that are designated as permissible.
4. **Note: Any unspent Planning Grant funds remaining at the end of the grant term must be returned by the recipient to the Department.**

| CATEGORY | DESCRIPTION OF EXPENSES | FUNDING REQUESTED |
|--|---|-------------------|
| 1000 – Personal Services | PI | \$4,016 |
| | Instructional coach @ Buford | \$91,900 |
| | Research Admin | \$3,685 |
| | Research Admin | \$9,281 |
| 2000 – Employee Benefits | Fringe Benefits faculty -28% | \$1,124 |
| | Fringe Benefits staff -37.7% | \$39,534 |
| 3000 – Purchased/Contractual Services | PVCC | \$10,000 |
| | C4K | \$5,000 |
| | Boys and Girls Club of Central Virginia | \$5,000 |
| | Food for Curriculum Design Academy | \$1,000 |

| CATEGORY | DESCRIPTION OF EXPENSES | FUNDING REQUESTED |
|-------------------------------|--|-------------------|
| 4000 – Internal Services | Copying / Printing | \$260 |
| 5000 – Other Services | Incentives - Summer Curriculum Design Academy for 4 in-service teachers | \$19,200 |
| | Incentives - Community Members Curriculum Design Academy involvement for 6 members | \$6,000 |
| 6000 – Materials and Supplies | Project materials | \$4,000 |
| Total | | 200,000* |

*** Total cannot exceed \$200,000 with additional funding considered at the discretion of the Department on a case-by-case basis and in accordance with available funds.**

Please visit the [Virginia Department of Education OMEGA object codes universal guidelines](#) for a complete description of the budget categories.

Object Code 1000 Personal Services

\$4,016: Stephanie Rowley, Dean of the School of Education and Human Development will serve as the Principal Investigator of the grant (1% effort).

\$91,900: Instructional coach @ Buford to organize, implement, and lead planning grant activities at Buford Middle School (95.83% effort).

\$9,254: Research administrative support at UVA to administer planning grant: Anatolii Utkuzov (5% effort: \$3,685), and Amanda Doherty (8.33% effort: \$9,281). This level of support is adequate for Utkuzov and Doherty to complete their duties.

Object Code 2000 Employee Benefits

\$1,124: Fringe benefits for Dr. Rowley.

\$39,534: Fringe benefits for other staff personnel: Instructional Coach and 2 Research Admins. These costs are imposed by UVA, with faculty fringe benefits rate of 28%, and staff rate of 37.7%.

Object Code 3000 Purchased Services

\$10,000: Piedmont Virginia Community College (PVCC) administrators and faculty to engage in proposed planning work to build out collaborations among CCS, PVCC, and UVA at the lab school.

\$5,000: C4K to engage in proposed planning work to build out community collaborations at the lab school.

\$5,000: The Boys and Girls Club in Central Virginia to engage in proposed planning work to build out community collaborations at Buford Middle School, where the Cherry Avenue Clubhouse is co-located.

\$1,000: Food for Curriculum Design Academy. Approximately 20 participants (4 in-service teachers, 6 community members, ~6 pre-service teachers, 4 lab school staff/UVA faculty) for multiple days during the Academy.

Object Code 4000 Internal Services

\$260 - Copying / Printing.

Object Code 5000 Other Charges

\$19,200: Teacher Incentives for Summer Curriculum Design Academy for 4 in-service teachers, \$4,800 each.

\$6,000: Community Member Incentives for Curriculum Design Academy involvement for 6 members, \$1,000 each.

Object Code 6000 Materials and Supplies

\$4,000: Project materials for computing technologies and other pilot curricular needs.

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APPENDIX: PLANNING GRANT APPLICATION EVALUATION RUBRIC

For the applicant’s information, the following will be used as the Planning Grant Application Evaluation Rubric for this application. Applicant does not need to complete this section.

| AREA OF CONSIDERATION | DESCRIPTION | POINTS AVAILABLE |
|--|--|------------------|
| Targeted Student Population(s) and Relevant Research | Application proposes intention to serve at-risk students and/or offer a new, innovative model of instruction grounded in evidence-based practices to improve student academic proficiency, mastery, college and career readiness, and long-term outcomes. | 30 |
| Clarity of Program Description Goal, and Timeline | The program description and goal are clear and attainable. Indication of programmatic, operational, and infrastructural capacity to advance an application to launch a Lab School program, as well as launch a Lab School no later than the 2024-2025 school year. Additional preference will be given to applicants with an earlier Lab School launch timeline. | 20 |
| Sustainability | Evidence of institutional commitment to the viability of a Lab School in a manner that promotes quality, innovation, program results, and sustainability. | 20 |
| Collaboration | Evidence of engagement and collaboration with stakeholders, including local school divisions, community-based organizations, employers, teachers and parents. | 15 |
| Regional and Applicant Diversity | Evidence of diversity of location, with the goal of Lab Schools in each Superintendent region. For applicant diversity, preference will be given to new applicants in the event a concurrent applicant has previously received a Planning Grant during the current application period. | 15 |