Virginia Chapter
Association for Learning Environments
2017 Annual Conference
May 1-2, 2017

Designing Schools For Future Makers

ARCHITECTURAL EXHIBIT AWARDS
MAY 2, 2017

Virginia Chapter
Association for Learning Environments

2017 Annual Conference
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ARCHITECTURAL EXHIBIT AWARDS

Total 11 entries

Virginia Chapter
Association for Learning Environments
Annual Conference
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ARCHITECTURAL EXHIBIT AWARDS

Category: Renovation Projects

AWARDED

BAILEY'S UPPER ELEMENTARY SCHOOL FOR THE ARTS AND SCIENCES
OFFICE TO SCHOOL CONVERSION

Fairfax County Public Schools
Superintendent: Steve Lockard

Design Firm:
Architectural Firm: Cooper Carry
Builder
John C. Grimberg, Co. Inc.

AWARDED

BAILEY'S UPPER ELEMENTARY SCHOOL FOR THE ARTS AND SCIENCES
OFFICE TO SCHOOL CONVERSION

DATA:

student capacity: 750
area of building (SF): 110,045 SF
total project cost**($): $11,915,323
cost per square feet: $108.27 / SF

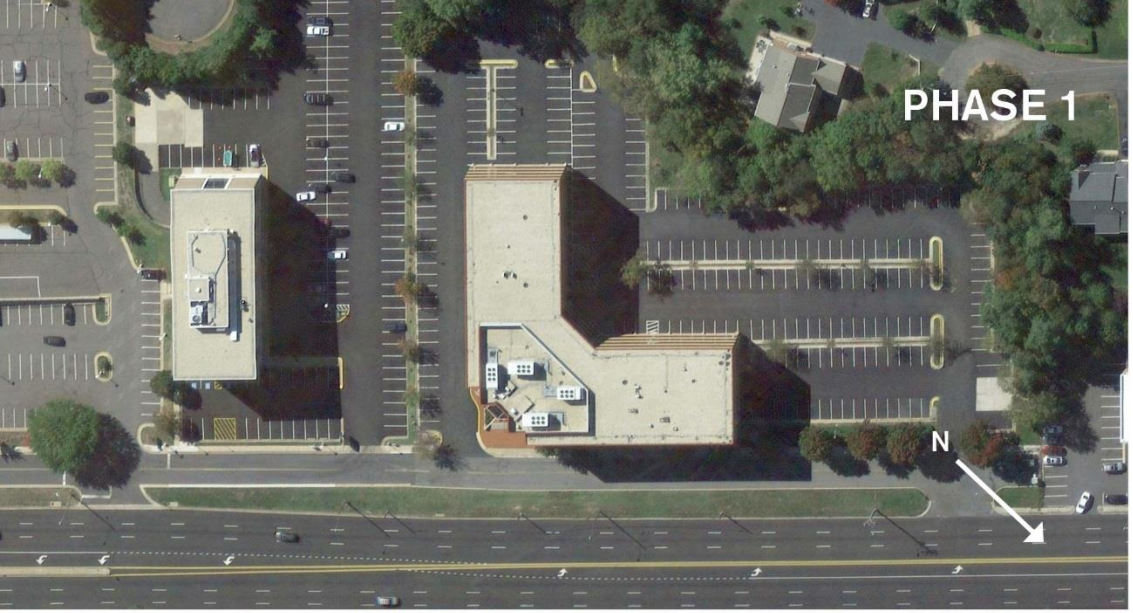
**All numbers are for Phase 1*

BAILEY'S UPPER ELEMENTARY SCHOOL FOR THE ARTS & SCIENCES

OFFICE TO SCHOOL CONVERSION

Bailey's Elementary School for the Arts and Sciences was well beyond capacity with half of their 1,400 students housed in trailers. To alleviate this overcrowding, this project converted an existing 5-story office building into a new school. Bailey's Upper Elementary School for the Arts and Sciences now sits about a mile from the original school and serves 750 of the Bailey's students.

As the first mid-rise elementary school in Fairfax County, the vertical design groups classrooms into two-story learning communities that open onto common learning areas and an interconnecting stair. The project includes administration space on the ground floor and classrooms on floors two through five. Phase 2 of the project addressed site upgrades such as additional outdoor play areas and an enclosed field house.


PHASE 1
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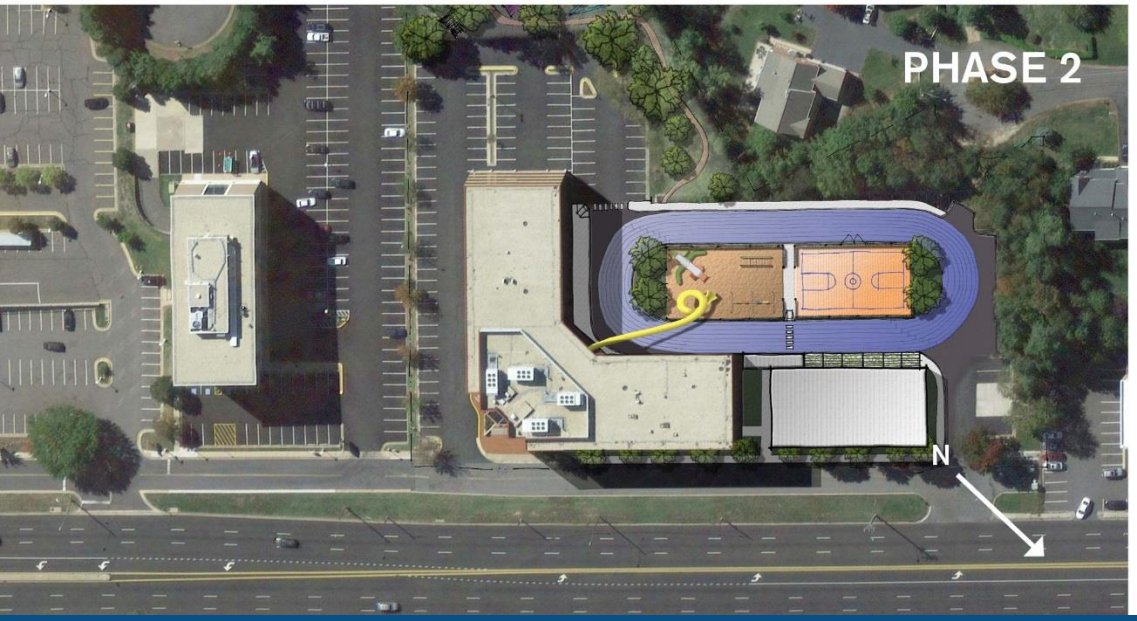
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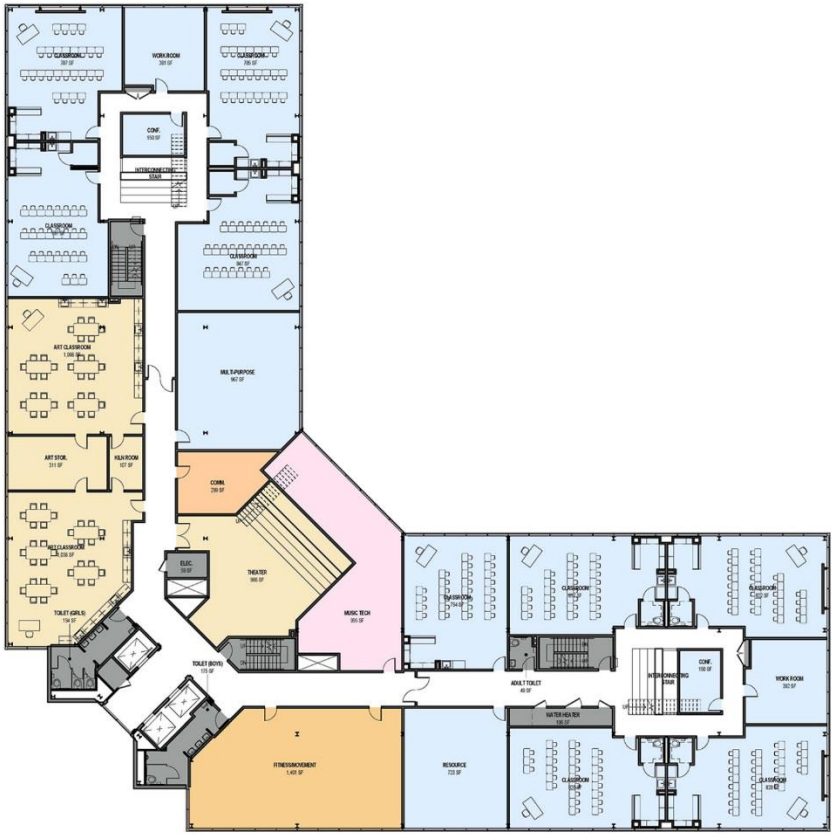
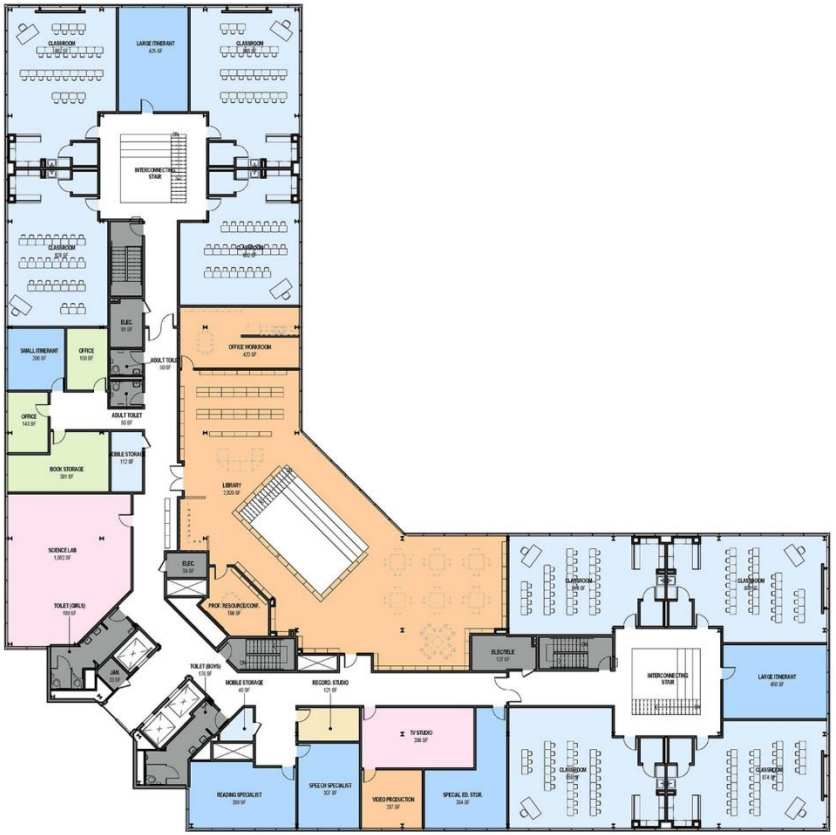
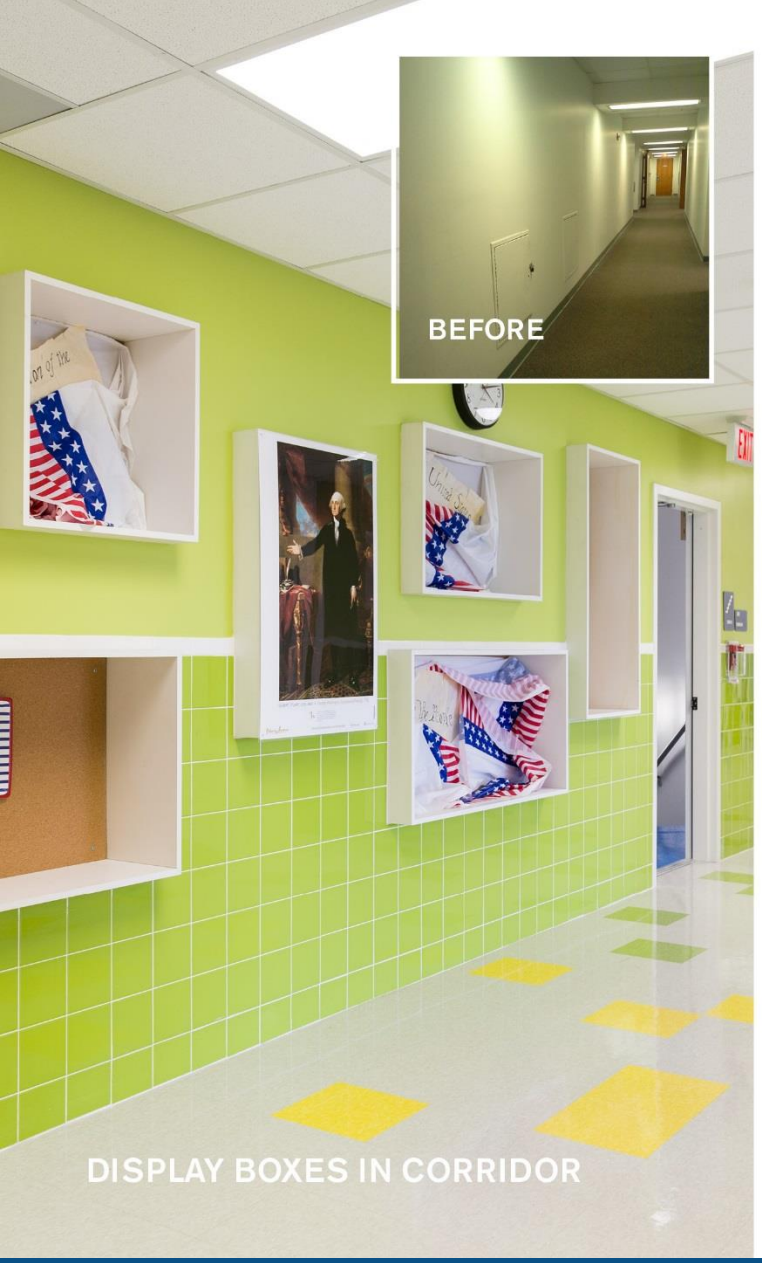
EXTERIOR
Bailey's Upper
Elementary
School
for the Arts and Scie





CLASSROOM LEVEL FLOOR PLANS


BEFORE
DISPLAY BOXES IN CORRIDOR


WaterRower Club
WaterRower Club
WaterRower Club
FITNESS AREA


FITNESS AREA

ASSOCIATION FOR LEARNING ENVIRONMENTS
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Designing Schools for Future Makers

ARCHITECTURAL EXHIBIT AWARDS
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ARCHITECTURAL EXHIBIT AWARDS

Category: New Elementary Schools

AWARDED

DISCOVERY STEM ACADEMY

Newport News Public Schools

Superintendent: **Dr. Ashby Kilgore**

Design Firm: **Grimm + Parker Architects**

Builder: **Oyster Point Construction**

AWARDED
DISCOVERY STEM ACADEMY

DATA:

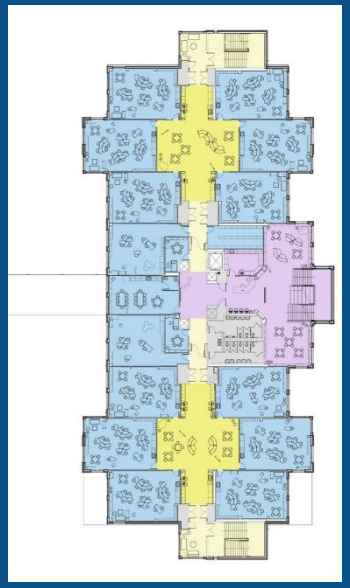
student capacity: 850
area of building (SF): 97,000 SF
total project cost($): $ 23,000,000.00
cost per square feet: $ 237/ SF

Discovery STEM Academy

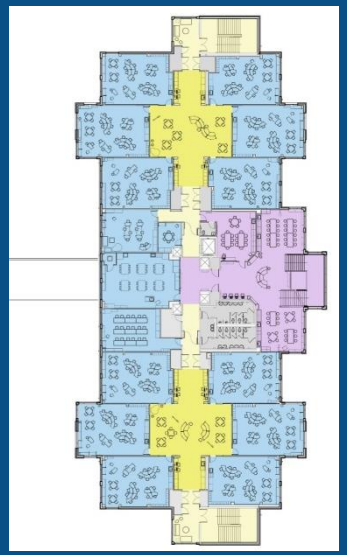
The new Discovery STEM Academy embraces Newport News Public Schools' (NNPS) significant STEM (Science, Technology, Engineering, and Math) pedagogical initiative where learning spaces facilitate learner-centered, student-driven, real-world, project-based learning. These environments promote a "learning revolution" by focusing on the whole person and where students are challenged to be innovative, adaptable, and to operate in collaborative ways. NNPS believes that students should be exposed to holistic learning opportunities that advance their intellect, health, and spirit. The four fundamental principles intended to promote a holistic student are Leadership, Nutrition, Fitness, and Discovery. Recognizing the essential ties between the school and the community, the facility is also designed with a wing for community resources. NNPS' vision for these learning environments is defined by three guiding principles:

1. Build the skills, knowledge, and expertise students need to be college, career, and citizen ready
2. Develop the wellness of students by providing environments that promote, support, and educate about proper nutrition and regular physical activity.
3. Provide a "learner-centered" culture of creativity and innovation for consistent student achievement and success.

Second Level Floor Plan



Third Level Floor Plan



Site Plan | First Level Floor Plan

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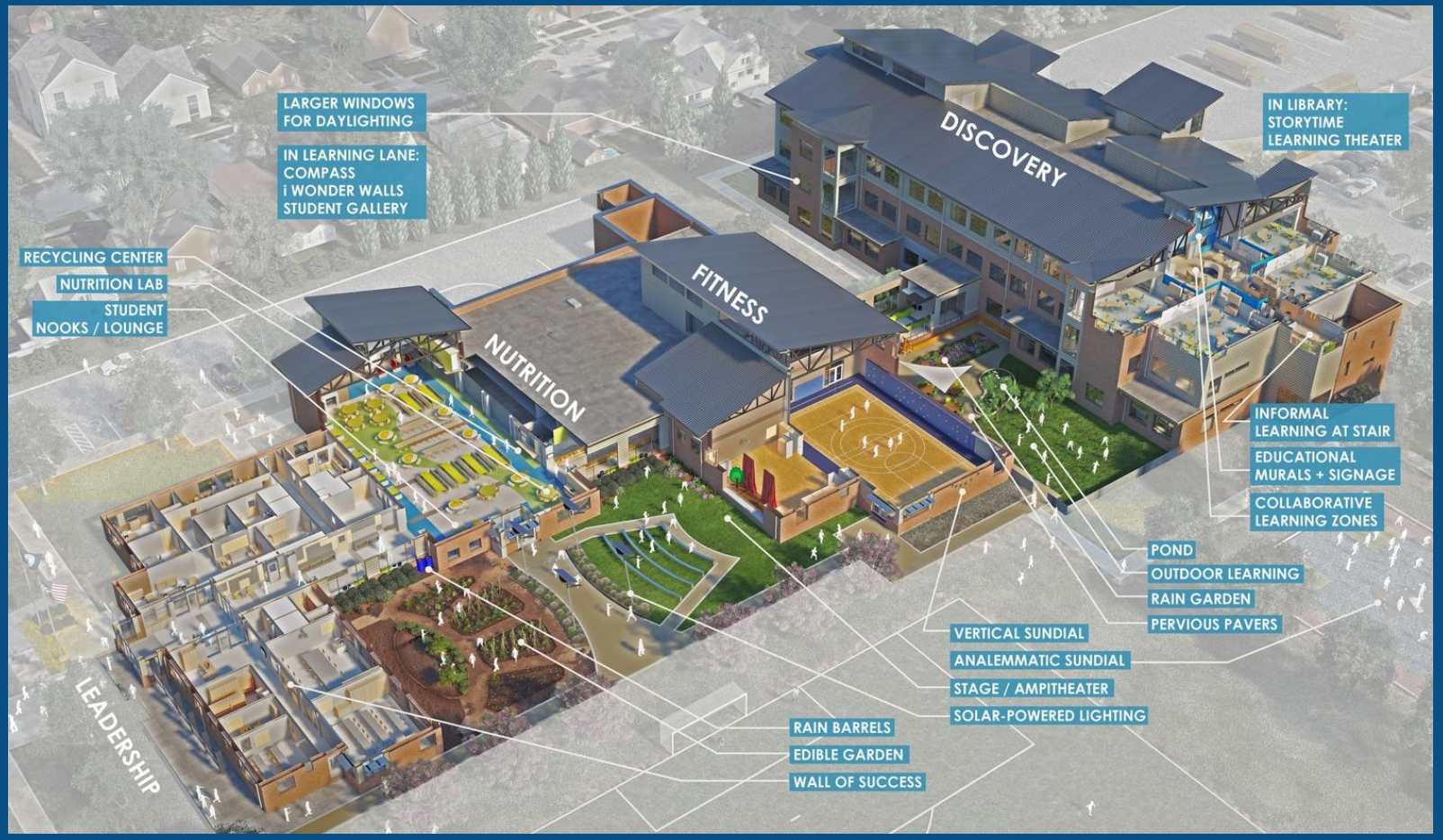
Innovative Features



The four fundamental principles of the holistic student are represented in the organization of the building's floor plan. Celebrating the collective and acknowledging that all individuals are part of a greater whole, the design provides the kinds of spaces and places needed to foster a sense of community both within and beyond the school. Flexible spaces that create diverse environments from inside to outside reflecting the fact that students DO matter.

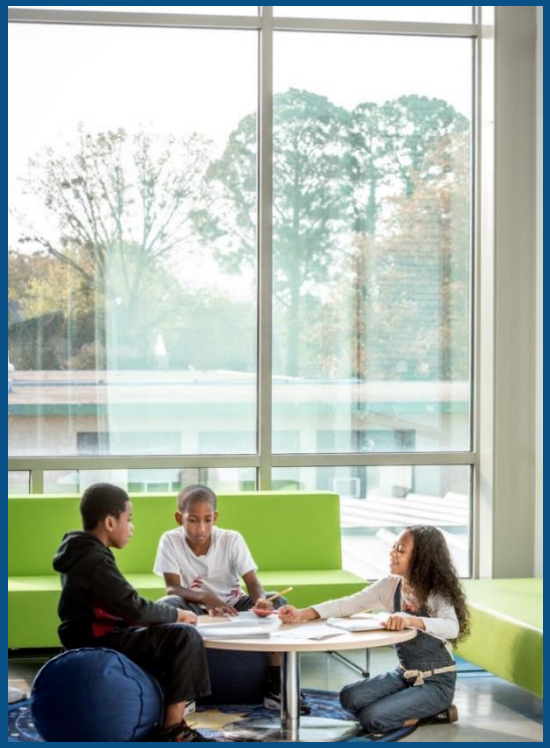
Outdoor Discovery Lab

Environments to support contemporary models of teaching facilitate learning in the most authentic way – creativity, inspiration, and commitment informed by real-world evidence and experience, where those who desire to use their heads, hands and hearts to productive endeavor will not only thrive, but prosper. Full of interesting things to monitor and discover and get your hands dirty, outdoor learning environments are a necessity for connecting students to the natural world.

Nutrition and Fitness Labs

Two-thirds of Americans are either obese or overweight. The design promotes awareness and possibilities of healthy food choices and maximizes the opportunities for physical activity as part of the school day.

Collaborative Learning Zone (CLZ)



75% of students learn best by doing. In a STEM curriculum aimed at leveraging the power of collaboration, the CLZ offers spaces that are adaptable and multifunctional, promoting highly flexible learning environments. It is often a small group of individuals using their minds, books, technology, and other "quiet" manipulatives to create new knowledge together. It is also often a large group with access to a wide variety of manipulatives collaborating to deliver performances or build tangible objects in this environment specifically equipped to facilitate the tasks at hand.

Tinker Lab

An integrated maker-space where students foster skills such as communication, problem-solving, critical thinking within collaborative activities that allow for active hands-on learning. Learning and its effects are on display throughout the school.

Learning Studio

Beyond providing compulsories to support a modern, comprehensive educational program the design celebrates teaching and learning, inspires greatness, and encourages lifelong learners. It provides the places and spaces necessary to foster the learned abilities, skills, and behaviors required of students as citizens of the world – creativity and collaboration.

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ARCHITECTURAL EXHIBIT AWARDS

Category: New Middle Schools

AWARDED

FREDERICK COUNTY MIDDLE SCHOOL

Frederick County **Public Schools**

Superintendent: **Dr. David Sovine**

Design Firm: **Stantec Architecture**

Builder: Branch & Associates

AWARDED
DISCOVERY STEM ACADEMY

DATA:

student capacity: 900
area of building (SF): 185,000 SF
total project cost($): $ 41,500,000.00
cost per square feet: $ 224/ SF

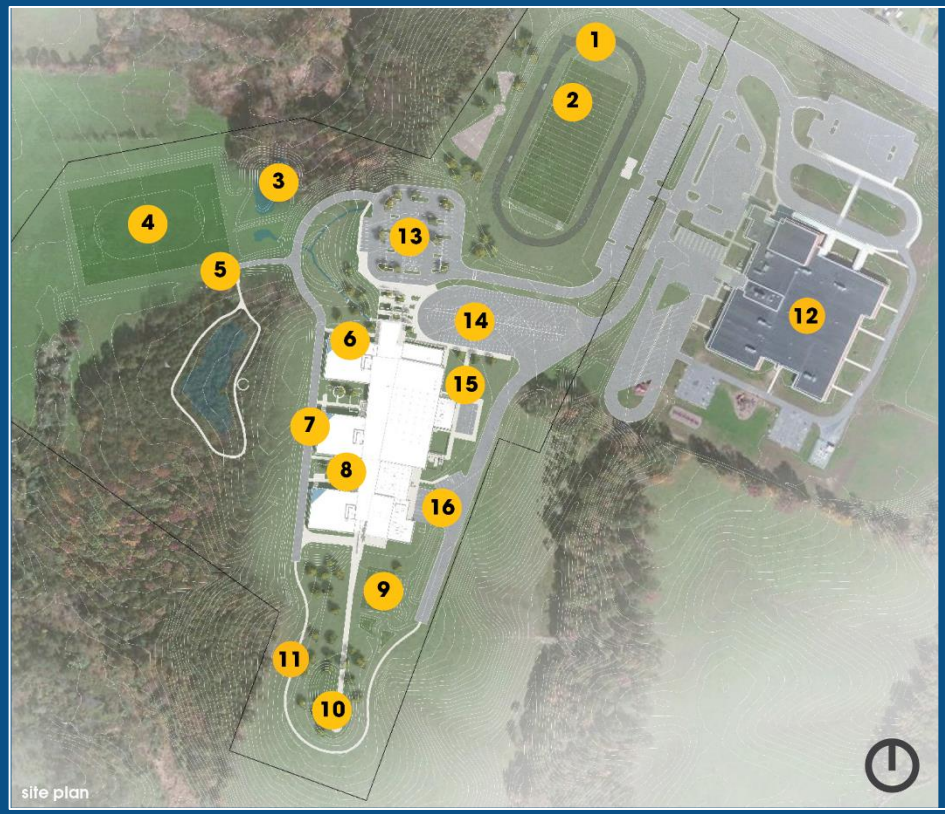
New Middle School

Based on current research, this project is a specific response to adolescent mental, physical, and emotional development. The multi-story design is organized into nine learning communities configured to promote interdisciplinary, collaborative, and self-guided learning. Built-in flexibility allows the facility to adapt to suit the varied needs of learners and support new methodologies as programs evolve. Unique features and educational graphics make every space a learning place and leverage the facility itself as a teaching tool.

Site Plan

The siting of the building responds to the topography of the sloping site and provides dramatic views of the surrounding mountains. The massing of the building responds to solar orientation, integrates outdoor learning spaces and breaks down a large building.

1. Competition Field & Track
2. Geothermal Boreholes (135 @ 500')
3. Stormwater Features
4. Recreational Field
5. Wastewater Treatment System
6. Art Terrace
7. Rainwater Harvesting
8. Outdoor Learning
9. Outdoor Play
10. Astronomy Terrace
11. Fitness Trails
12. Gainesboro Elementary School
13. Drop off/Staff Parking
14. Bus Loop
15. Play Court
16. Service




Southwest aerial view


Northeast aerial view

01 Level

02 Level

03 Level

Floor Plans

- Circulation
- Toilets, mechanical, support spaces
- Fine arts (art, band, chorus)
- Administration
- Athletics
- Learning Studios
- Cafeteria and concessions
- Media center / IT

Project Goals

Student-centered

As one project advocate stated, "A student ought to be able to stand anywhere in this building and know without a doubt that it was designed for them."

Highly-adaptable

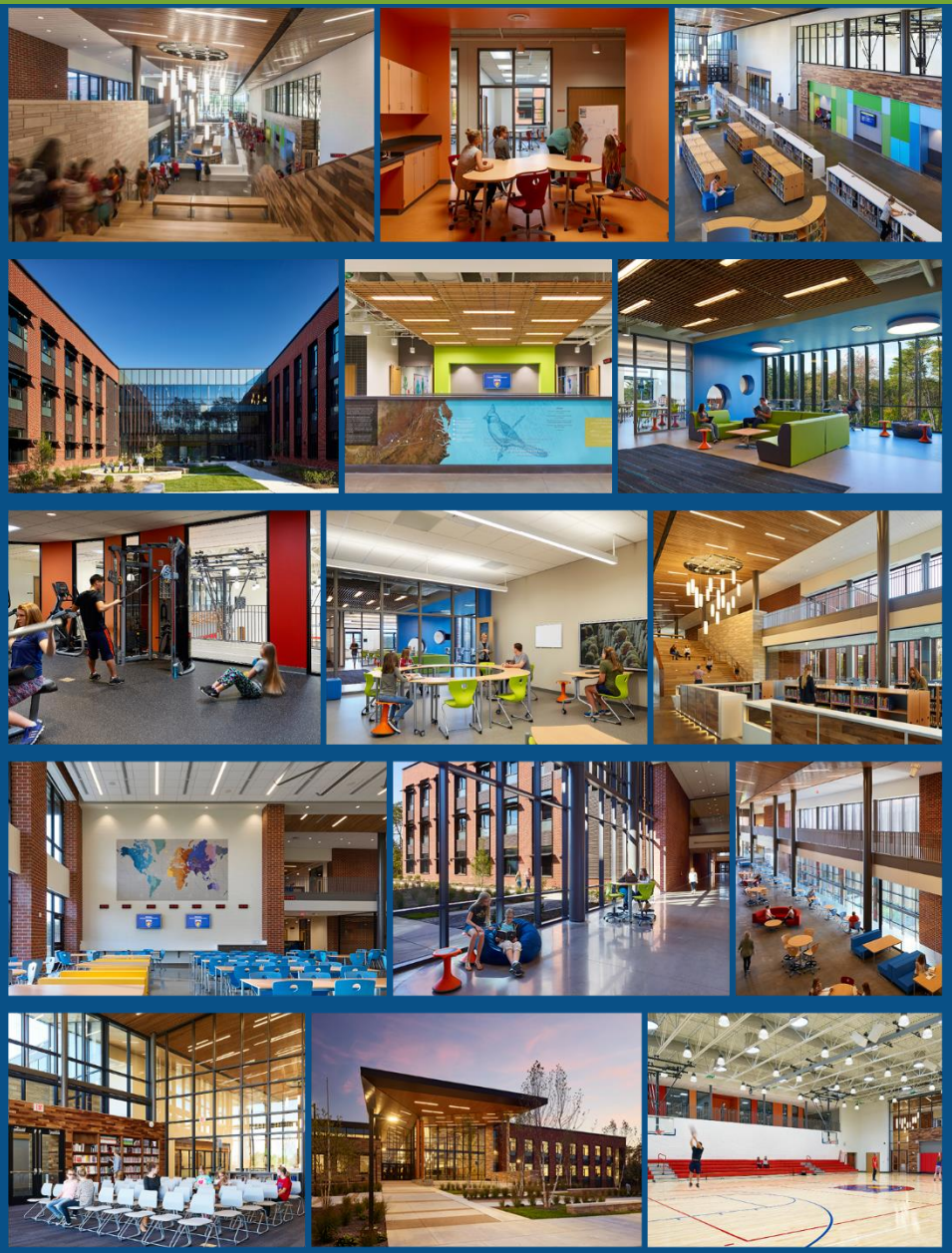
The learning environment supports collaborative, hands-on, digital, and self-directed learning opportunities as well as more traditional forms of teacher-guided instruction. Likewise, the building should flex to address the needs of other users.

Community-oriented

The campus serves as a community resource and provides opportunities and spaces for multi-generational, extended-day, and community-based activities.

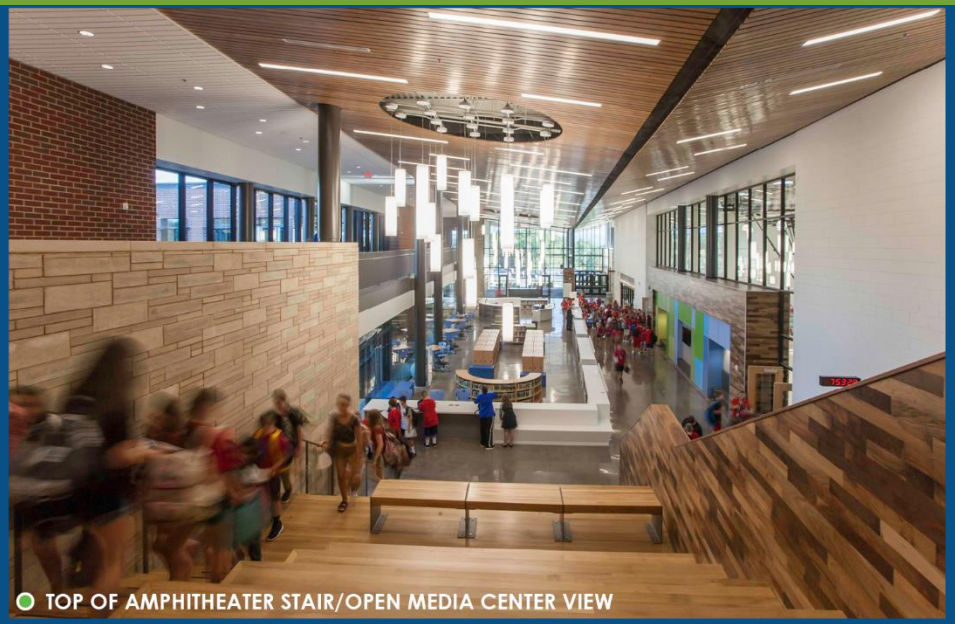
High-performing

The facility itself is operationally and functionally efficient and espouse the virtues of stewardship and sustainability reflected in the curriculum it supports.

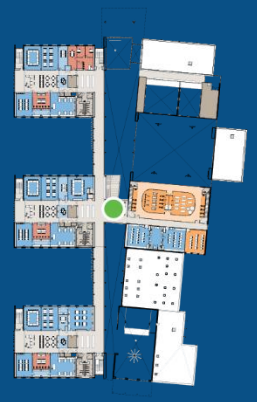


Commons/ Discovery Zone

The Commons is a dramatic see-and-be-seen space where learning is on display and students are encouraged to be both "plugged-in" and "hands-on" as they discover their passions and take an active role in their learning.

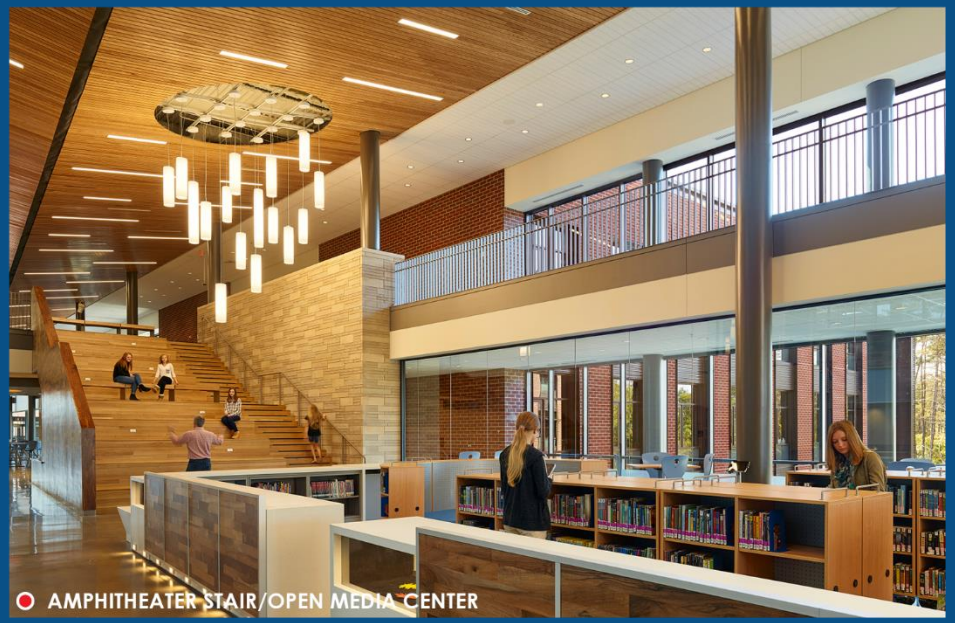


TOP OF AMPHITHEATER STAIR/OPEN MEDIA CENTER VIEW



03 LEVEL

OPEN MEDIA CENTER/GYM



AMPHITHEATER STAIR/OPEN MEDIA CENTER

02 LEVEL

Small Learning Communities

Each of the nine small learning communities has a unique identity and is designed to meet the specific needs of 100-125 learners. The Break-Out Space is a flexible zone that supports meetings, presentations, collaboration, tutorials, peer-to-peer exchange and independent learning. This space is supported by a Team Room, a semi-private meeting area full of tools and equipment to support learning. Various types and sizes of instructional spaces surround this central zone, including a High-Intensity Lab, a Low-Intensity Lab, two Learning Studios and a Resource Room.


BREAKOUT SPACE


ENTRANCE TO SLC/SIGNAGE PACKAGE

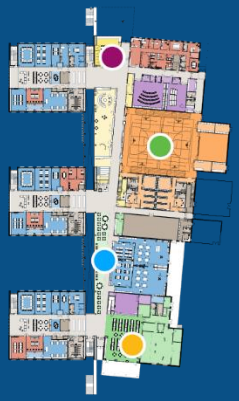

TEAM ROOM


02 LEVEL

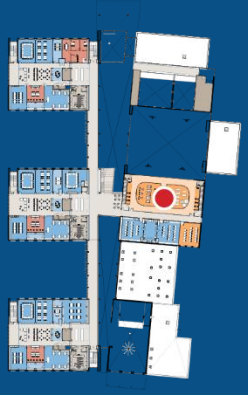

LEARNING STUDIO

Common Areas

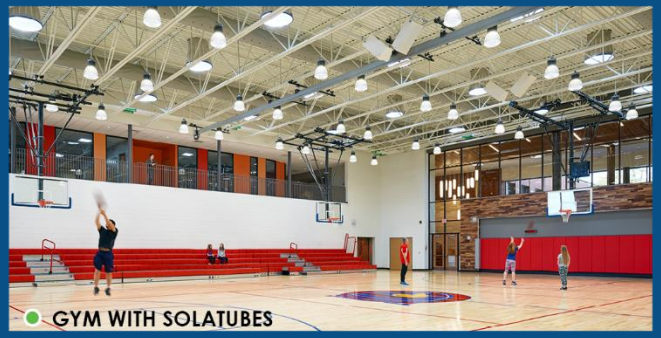
A variety of amenities including a community meeting room, dining commons, cafeteria with stage, competition and recreational fields, a fitness loft, and an astronomy terrace support public programs and extend the use of the facility as a 24-7 community asset.



02 LEVEL



03 LEVEL

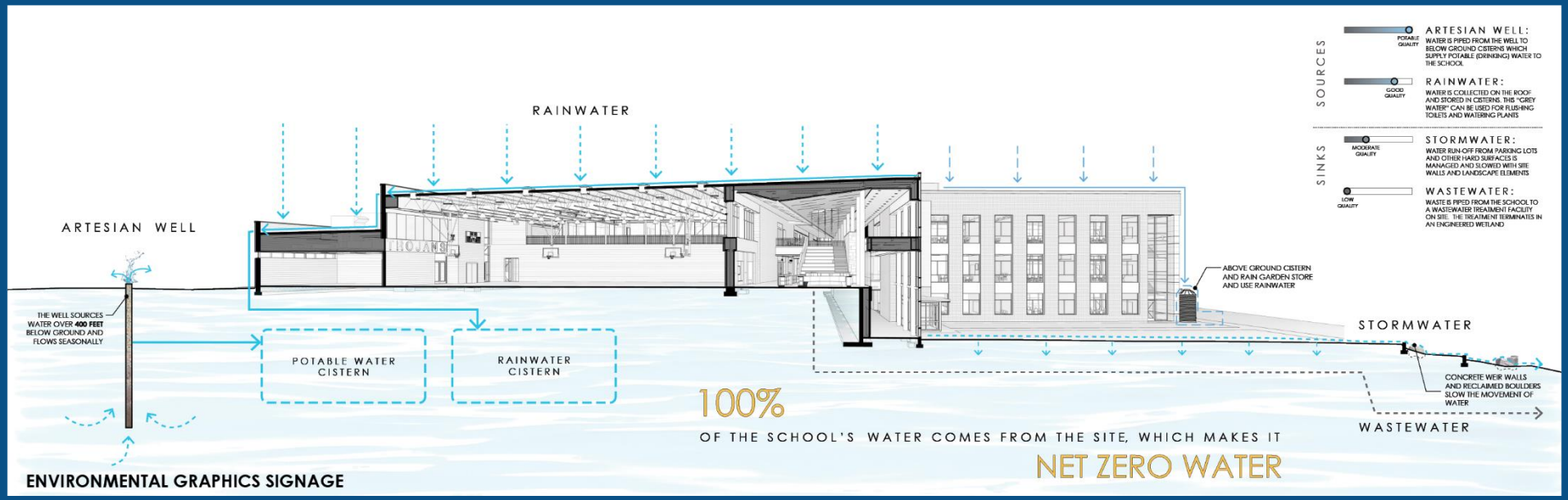


Sustainability

Sustainability features include hybrid geo-exchange HVAC systems, daylight harvesting, LED lighting, "green-light" natural ventilation, durable finishes, rainwater harvesting, on-site waste-water treatment system. With no pipes coming onto or leaving the site, this is the first net-zero water public school in Virginia.

The facility is designed to use just 30 kBTUs/SF/year - 70% less energy than a typical school in the region.

The client sought to put systems on display and celebrate unique features of the building as learning tools.



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ARCHITECTURAL EXHIBIT AWARDS

Category: Special Jury Award

AWARDED

DISCOVERY ELEMENTARY SCHOOL

Arlington County **Public Schools**

Superintendent: **Dr. Patrick Murphy**

Design Firm: **VMDO Architects P.C.**

Builder: Sigal Construction

AWARDED
DISCOVERY ELEMENTARY SCHOOL

DATA:

student capacity: 630
area of building (SF): 97,588 SF
total project cost($): $ 32,830,000.00
cost per square feet: $ 336/ SF

Discovery Elementary School

Arlington Public Schools, VA

Discovery Elementary School is the first net-zero energy school in the Mid-Atlantic and the largest in the United States. As a carbon neutral producer of clean energy, the school offers a positive example of a solution to the global crisis of climate change – and along the way emboldens students with the expectation that they are creative participants in those solutions.

Setting a New Standard for a New Century

Discovery Elementary School is Arlington Public Schools' first elementary school designed in the 21st century. While built to address rapidly growing enrollment, the school was designed to meet a larger goal – to prove what can truly be achieved with a new public school. Every nook and cranny is arranged to create a seamless integration between design, sustainability, and learning. Recognizing that students are the creators of our collective future, Discovery Elementary sets the stage for the development of the skills necessary for long-term stewardship of our world.

Throughout a series of intensive community meetings, careful attention was focused on designing and building a school that supports how and where students learn. At the end of the planning process, which involved close to 50 public meetings, the project was overwhelmingly approved by multiple building committees with broad public support. Many of the project's initial opponents had become strong proponents – having been satisfied that their voices were heard and that they were active authors in the improvement of a valued neighborhood asset.

The school was designed to be "net zero energy," meaning that the amount of energy produced annually by on-site renewable energy sources is equal to the amount of energy used annually. An equally-sized APS school accrues approximately $120,000 in annual energy costs. By fully offsetting energy use through photovoltaic generation, Discovery helps redirect funds back to the APS operating budget, while allowing the community to enjoy the environmental benefits of a fully offset carbon footprint.

Savings from conservation alone were $78,000 in year one and are predicted to be $1,400,000 over twenty years. Income from the solar array will cover the array's portion of the bond payment around year six and produce a 20 year annual average return-on-investment of 16%.

Community Context

Nestled near the nation's capital, Arlington County is one of the fastest growing counties in Virginia and is rapidly urbanizing. Built in a residential neighborhood concerned about losing its character, Discovery needed to be both contextually sensitive to the neighborhood scale while also able to meet the demands of heavy after-hours use.

To preserve space, the school shares the site with an existing middle school and has been master planned for future middle school expansion. Open, programmable space is preserved as much as possible by situating a full third of the building's footprint on existing slopes. The school tiers into an existing hill to minimize the perception of its size while featuring exterior materials that are residential in nature and scale. Pre-K and Kindergarten students are grouped into three "kinderhouses" that mimic the size and spacing of adjacent homes.

To support ownership of the new school, the mascot, colors, and school name were chosen by a vote of the student body. The "Discovery Explorers" name reflects the forward-looking, inquiry-based learning that takes place in the building. The school name also serves as a tribute to John Glenn, who lived adjacent to the site when he became the first American to orbit the earth in 1962. In 1998, while still a sitting senator, Glenn returned to space as a crew member of the space shuttle Discovery, becoming the oldest person to fly in space.

Net Zero Energy Design

Considerations for site footprint, solar orientation, building construction, and energy use were given top priority in the iterative design process. With a capacity of 650 students in grades Pre-K through 5, the 97,588 SF building is designed for an Energy Use Index (EUI) of 23 kBTU/sf/year – 1/3 of the energy use of a typical APS elementary school. The school is currently maintains an EUI of 16.2, making Discovery the best energy performing school in the U.S. This ultra-low EUI makes on-site photovoltaic energy generation possible within a traditional school budget.

Achieving this low EUI involved meticulous evaluation of the way Arlington Public Schools (APS) builds and operates its facilities. Discovery's sustainable features include:

- 1,706 roof-mounted solar panels
- A geothermal well field
- Solar pre-heat of domestic water
- 100% LED lighting
- Ideal solar orientation and shading
- Insulated concrete exterior walls with high thermal mass
- Bioretention areas that clean and slowly release all of the water from the site
- A building dashboard system that tracks energy data in real-time and makes it available on every school device

Light is celebrated in multiple ways throughout the project, beginning with a solar calendar in the school's entry and culminating in a rooftop solar lab which allows students to conduct experiments. Along with the building's real-time energy performance, data from these experiments can be tracked and graphed using the school's building dashboard, which is accessible on any device with internet access.


Aerial View

Net-Zero Signage


Solar Lab

Site Design

The school's design takes advantage of the topography of the site to create distinct, tiered academic zones and separate exterior play spaces for early childhood, primary, and elementary grade levels. Discovery's public spaces are defined by a large roof canopy with a cedar soffit that runs the length of the school and serves as the school's "front porch." In addition to shading large expanses of glass that provide a strong visual connection to the outdoors, the roof overhang provides covered outdoor dining and play spaces. At the main entry, the roof extends out as a canopy with an oculus, which allows the entry plaza to serve as a large solar calendar.

The street side of the school is accented with warm colors – reflecting their south-facing solar orientation. On the north side, the school uses playful arrangements of cool colors, such as greens and blues, echoing the natural expression of moss that grows on the north side of trees.

South

North

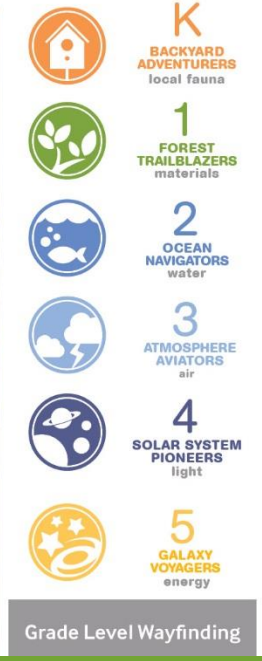
Theming + Graphic Wayfinding

The school's wayfinding goes beyond basic navigation to support a larger vision of spatial organization that reflects each grade's expanding curriculum and identity. This approach supports grade-level identity while also engaging and educating users as they interact with the building.

As students progress through the school, their "world expands" – with the first floor themed around animals found in earth eco-systems and the second floor themed around the elements of the sky and heavens. Students start out as Backyard Adventurers in Kindergarten and finish Fifth Grade as Galaxy Voyagers. This storyline is graphically communicated along an entry wall highlighting each Explorer grade level. On the first day of school, Explorers are able to "make their mark" in their expanding world by signing their name on the wall – and follow along as the mark moves down the wall over their six year journey at Discovery.

When students advance, so does the scope of their expanding world, both in graphics and in complexity of content. Educational signage connects the sustainable features of the building with factoids about the natural world. For example, water conservation is described in the Ocean; air quality is explained in the Atmosphere; and light and energy facts are featured in the Solar System and Galaxy, respectively.

Kindergarten Theming



Grade Level Wayfinding

Inspiring Learning + Creativity

Discovery Elementary inspires students and teachers to use the building creatively to facilitate everyday learning and lifelong exploration. In order to accommodate change and support engagement across grade levels, the school offers an extensive array of exterior playscapes and flexible interior furniture including stools, bean bags, cushions, height-adjustable tables and chairs, and reading steps, among other options.

Inside classrooms, flexible details such as foldable partitions, retractable garage doors, and various furniture offerings support teacher collaboration and cross-pollination. Throughout the school, one-to-one technology enables research and collaboration to happen anytime, anywhere. Dry erase and magnetic creativity walls located near a 2-story slide encourage student expression and ownership; Scrabble and Lego walls fuel linguistic and spatial exploration; and the "Hedge" (which encloses and defines the Kindergarten "Backyard") provides nooks and crannies that buzz with activity before, during, and after school.

Expanses of glass and extended learning areas located outside of classrooms provide subtle security measures – allowing teachers to facilitate learning or supervise from afar depending on the needs of the students and pedagogical aims.

With a reconfigurable range of learning spaces, the positive correlation between learning, high performance architecture, and student engagement continues to find expression in all types of unanticipated ways – demonstrating that Discovery should continue to provide meaningful settings for educational practices that are always evolving.

Cloud Commons with Scrabble Wall


The "Hedge"


Classroom with Foldable Partition for Team Teaching

Floor Plans

100'