

STEAM WING INTERIOR RENOVATION

NEW HOPE-SOLEBURY SCHOOL DISTRICT



EXECUTIVE SUMMARY

TRANSFORMATION OF AN UNDERUTILIZED SPACE INTO A TECHNOLOGY-RICH HUB FOR ENGINEERING, MULTIMEDIA, AND ROBOTICS ELEVATES THE SCHOOL DISTRICT'S STEAM PROGRAM.

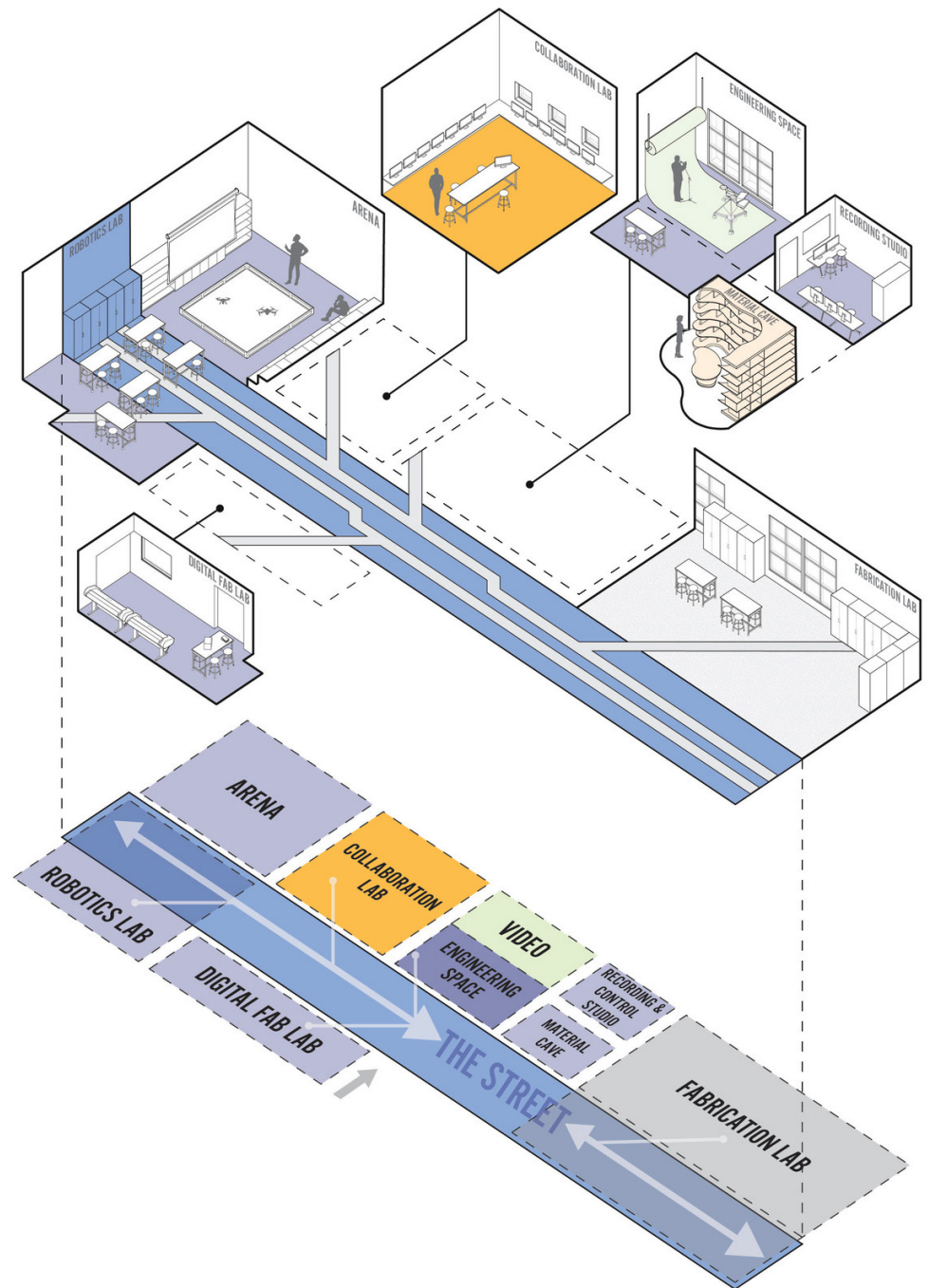
When the New Hope-Solebury School District in Bucks County, Pennsylvania, developed their 2020-2023 comprehensive plan, they determined that, in order to foster their students' growth, they needed to develop curricula that empowered "all students to become passionate, confident, and innovative learners with the ability to adapt to a diverse and global society."

Central to that goal was the renovation of an underutilized 4,500 square foot space in their high school into its new STEAM Wing, a flexible, multimodal space for engineering, multimedia, robotics, and more.

What was once a closed-off space hosting a redundant nurse's suite, an outdated computer lab, and a former darkroom is now home to a robotics lab and arena, collaboration lab, digital fabrication lab, video production area, material cave, maker space, and a wood shop, built to house classes during the school day and host extracurriculars and events, such as the newly formed junior varsity and varsity esports team, outside of school hours.

The space is home to state-of-the-art technology that will help their students enter a technology-rich, ever-evolving world, and was developed with the future in mind, its distinct yet interconnected zones are designed to enable the space to change as technology, curricula, and student needs change. Most importantly, its flexibility and welcoming design supports the district's "Portrait of a New Hope-Solebury Graduate," a strategic initiative to help students become future-ready with "skills inclusive of the 4 C's: creativity, collaboration, critical thinking, and communication."

In the four months the space has been open, registration for STEAM classes, such as engineering and robotics, has exploded, and the district is already looking to new ways to maximize usage of the space.



PROJECT DETAILS

OWNER:

New Hope-Solebury School District

LOCATION:

New Hope, PA

STEAM WING SIZE:

4,500 sf

CONSTRUCTION COST:

\$750,000

SCOPE OF WORK:

Comprehensive interior renovation of an area that previously housed a nurse's suite and an outdated computer lab into a cutting-edge STEAM facility. The renovation served as an opportunity to boost the school district's STEAM program and provides spaces in support of the school district's curriculum.

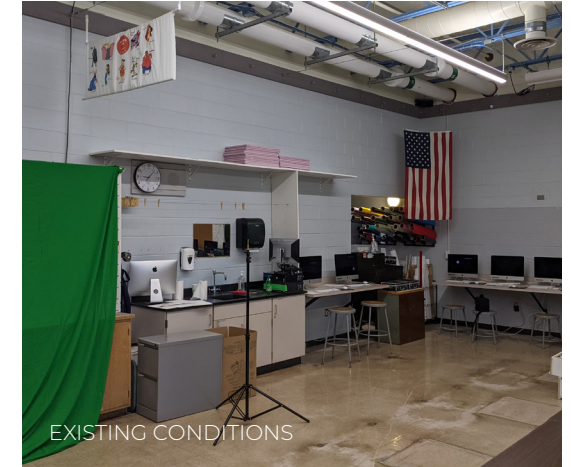
PROGRAM:

Maker space, robotics lab, collaboration lab, recording and control studio, material cave, wood shop, and digital fabrication lab.



SCHOOL & COMMUNITY

New Hope-Solebury is a small, academically rigorous school district in the heart of Bucks County, Pennsylvania, responsible for the education and development of 1,311 students grades K-12. The high school houses 499 students and ranks 10th on U.S. News & World Report's Best Pennsylvania High Schools list. With class sizes averaging 20-21 students and approximately 80-120 students per grade, the district puts strong emphasis on flexibility and personalized learning that supports each student's unique abilities and interests while preparing them for the real world.



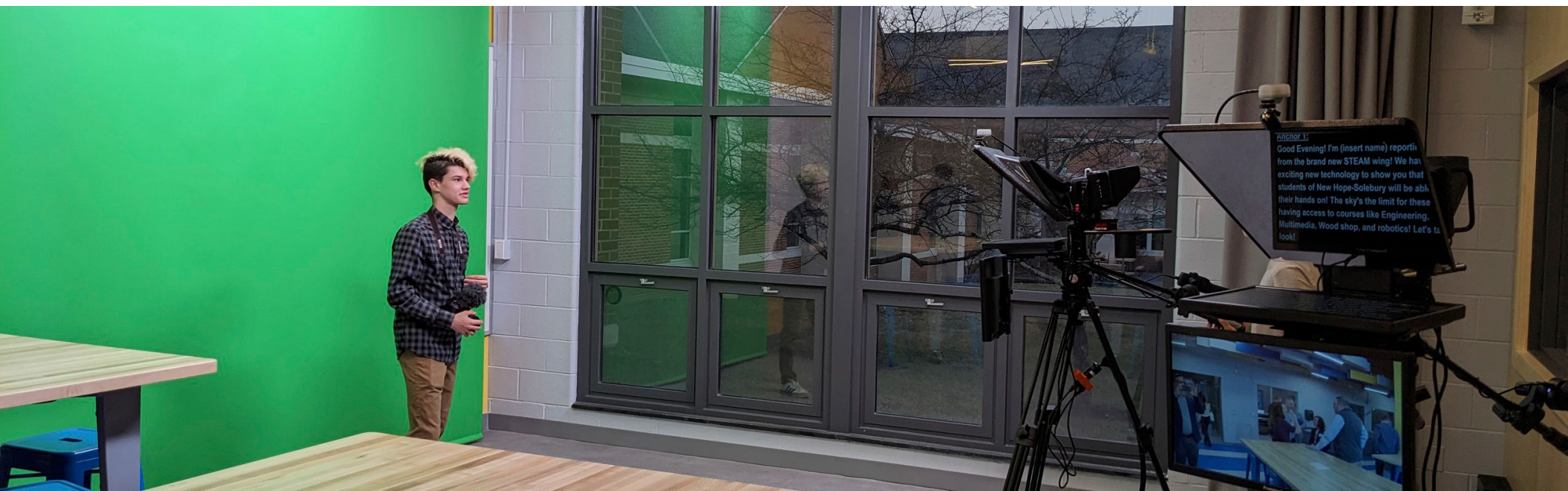
WHO IS THE NEW HOPE-SOLEBURY STUDENT?

The district's 2020-2023 strategic plan, developed by 80 stakeholders engaging in a year-long, extensively researched process, has identified what they called the Portrait of a New Hope-Solebury Graduate, 11 components their academic programming will foster in their students.

These components are:

- Civically minded
- Globally responsible
- Collaborative
- Good communicator
- Confident
- Creative
- Critical thinker
- Inquisitive
- Ethical
- Resilient
- Socially and emotionally intelligent

Part of this push included developing a comprehensive, world-class STEAM program with the flexibility to function as a classroom, an events space, a hub for creativity, and ground zero for the tech-driven personal interests of students. The space is housed in the New Hope-Solebury school district building, strategically between the high school and middle school portions of the building. It was designed and built with all students from K-12 in mind, with programmatic elements that can capture the interests of students of all ages, foster interests, and prepare students for job opportunities, internships, and more.

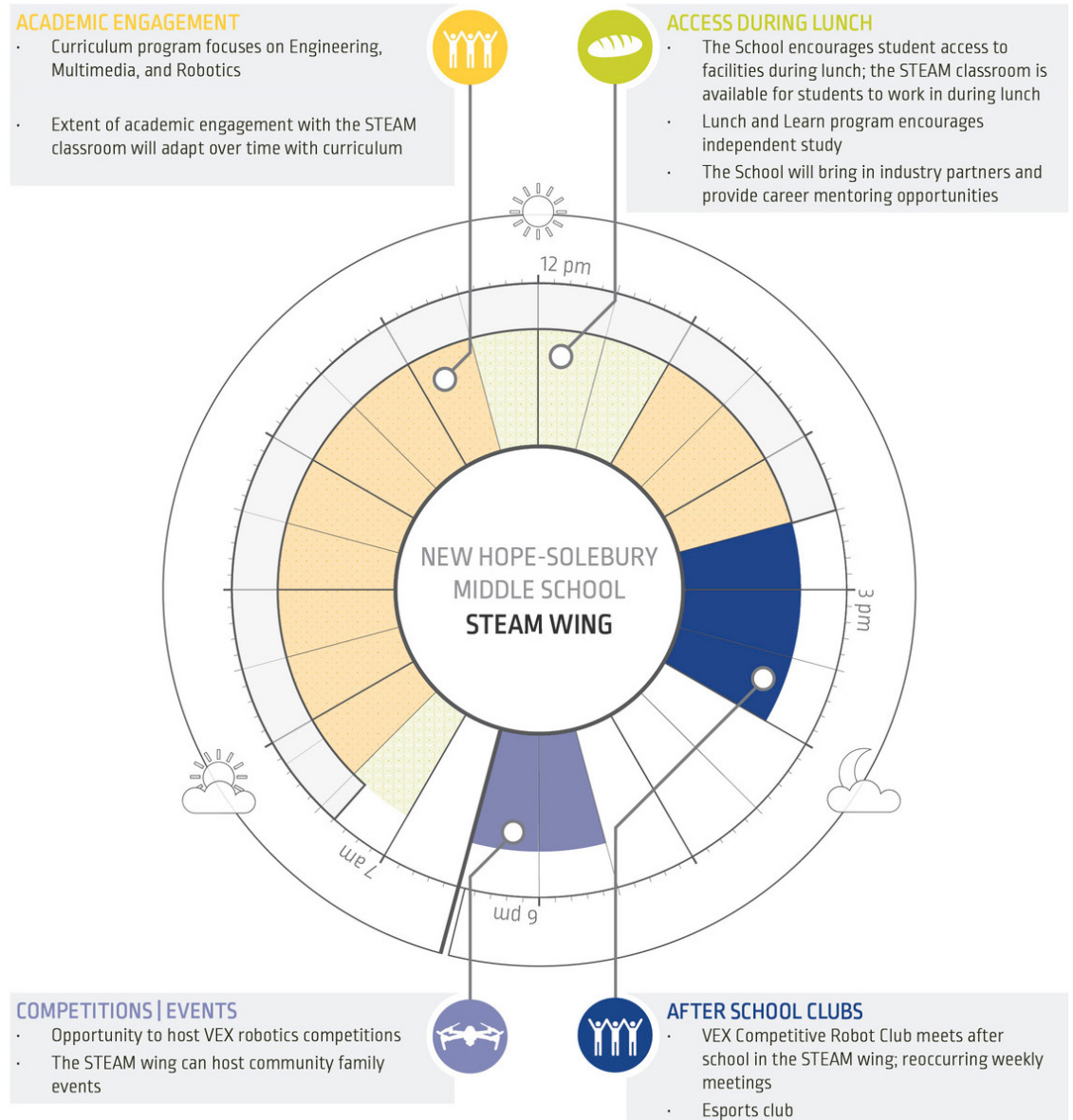


DESIGNING FOR A WELCOMING EDUCATIONAL EXPERIENCE

As members of the School Superintendents Association's (AASA) Learning 2025 movement, NHSD had the opportunity to visit schools across the country who have launched similarly innovative pilot programs that adhere to the Learning 2025 mission of Student-Centered, Equity-Focused, Future-Driven Education. And through a combination of their work with AASA and research on local tech-ed and computer science programming, NHSD was able to pinpoint how to develop a STEAM program that would not only be academically enriching but also call in many students with opportunities to participate and socialize who otherwise may not have joined the clubs and teams that are essential to holistic, positive development.

The STEAM Wing, then, had to be more than just a space. More so than squeezing in the right elements and machinery to help their students learn the technology that will get them jobs and help them succeed long after they graduate, NHSD envisioned a space that meets students where they are and helps them build a toolkit of emotional and social skills they'll need long after graduation.

One-size-fits-all education, direct instruction, and passive learning are the pedagogical modalities of yesteryear. The STEAM Wing calls in students and empowers them to become collaborators in their own education. The learning that takes place in the STEAM Wing, whether in a formal classroom or during an afterschool activity, is interactive and tactile, fostering independence and ensuring that students are empowered to find their passion, no matter what.



EDUCATIONAL ENVIRONMENT

To meet specific district goals, the STEAM Wing design process considered more than just the physical space and machinery to be included in the footprint. A cornerstone of NHSD's strategic plan to support their Portrait of a New Hope-Solebury Graduate was the development of their Career Pathways program, three educational paths students can choose based on their interests: 1) Arts and Humanities; 2) Business and Communication; and 3) Health Sciences, STEAM, and Innovation.

When students choose a path, they receive individual course and extracurricular recommendations, work-based learning opportunities, and access to guest speakers most relevant to their interests. Each pathway is built with flexibility and holistic learning in mind, allowing students to explore, change their minds, and become independent, creative, critical thinkers.

The STEAM Wing, while housing engineering, robotics, and fabrication, is also home to a

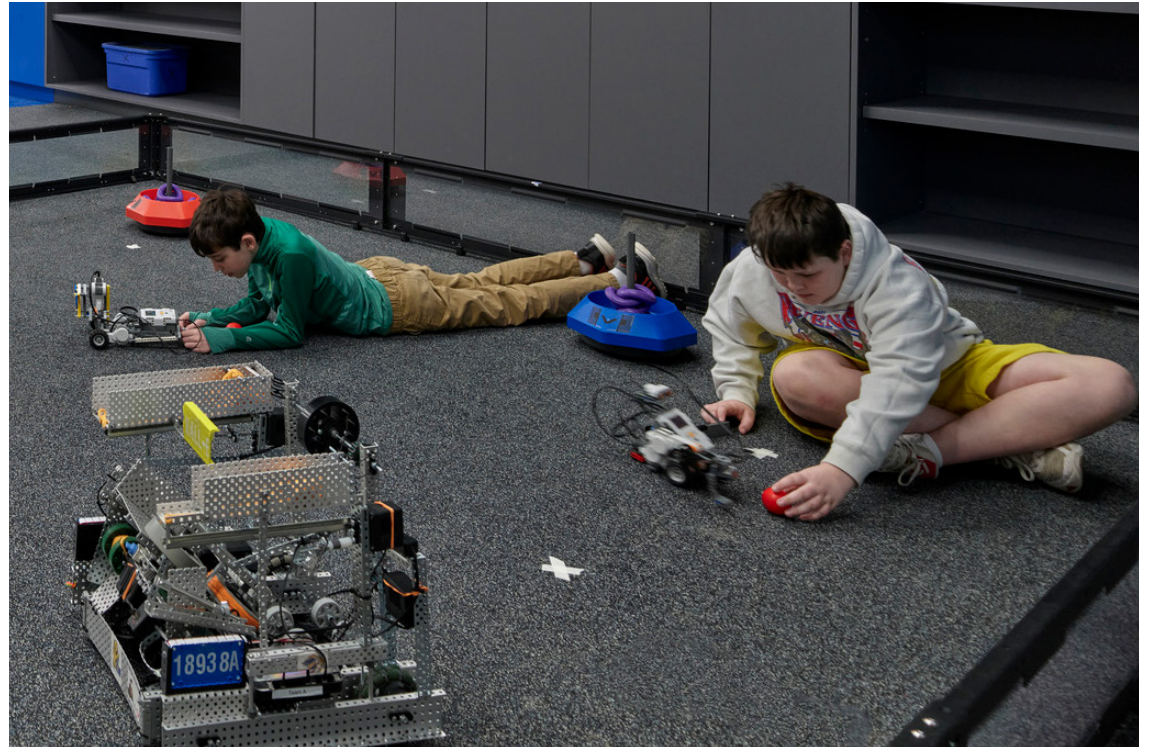
multimedia space that includes a recording studio and video space as well as a general collaboration space for any student who wants to use it. This is a deliberate symbolic and pedagogical choice that starts to marry the hard sciences and what have been too long considered "soft skills," thereby starting the essential work of collapsing the false binary between math/science and creative pursuits so often associated with the humanities.



HOLISTIC EDUCATION, INCREASED OPPORTUNITIES, WELL-ROUNDED STUDENTS

Students are, above all, humans, who have social, emotional, and ethical needs that educators have a duty to address and help support. According to extensive research, doing our ethical duty as educators is also one of the best ways to help students with long-term success. According to a 2020 McKinsey report on intentional learning, learning itself is a skill which predicts (and drives) long-term success, especially given the speed at which economic drivers—including technology—change. Inherent in teaching the skill of intentional learning is creating opportunities for students to explore and learn on their own terms.

When designing the space, it was imperative to build a space that calls in students, regardless of their chosen Pathways, and allows different learning modalities, from social-based learning in club settings such as the robotics club to instruction on equipment such as 3D printers and recording equipment. While the space is interconnected, there are distinct areas to maximize usage and functionality; further, students can enroll in formal classes or, if they're unsure of what they'd like to do, they can join clubs or otherwise work with staff to find means of exploring the space that works for them. Encouraging students to explore their curiosities is key to achieving the Portrait of a Graduate.



REAL WORLD EDUCATION, FLEXIBILITY FOR THE FUTURE

The only constant in life is change, and that goes double for both education and technology.

The STEAM Wing encourages and enables curiosity, allowing students to play around with technology and equipment they might otherwise not have exposure to unless purposefully and single-mindedly seeking it out. It is also designed with flexibility and change in mind: student interests and technology change rapidly, and this space is built to change and grow as necessary to continue serving students' best interests, with physical spaces that can easily be updated and outfitted as necessary.

LOWERING BARRIERS TO ENTRY

Too often, the most technologically driven career fields have high barriers to entry, particularly due to the steep learning curve of some more technical skills; the STEAM Wing supports early intervention and marries STEM interests with more traditionally creative pursuits (such as graphic design and video and sound engineering). By giving these students a foundational understanding of the software, machinery, and other technology that drives innumerable industries, and reinforcing these learning opportunities with relevant classes and guest speakers, also hosted in the STEAM Wing, NHSD students will enter the world, equipped with hard skills and the ability to learn and adapt to whatever changes life throws their way.



PHYSICAL ENVIRONMENT

When designing the physical environment, wow factor was key. It had to be a space that was light-filled, flexible, built for ease of movement, and visually interesting enough to draw in students like a magnet, especially those students who might otherwise have been apprehensive to enter what was once a cloistered, outdated space with limited capabilities.



DISTINCT BUT INTERCONNECTED

The STEAM Wing functions a bit like a lively main “street”, with distinct zones that can be closed off with movable glass partitions to create classrooms and quiet spaces or opened up to allow for larger crowds to watch robotics competitions or participate in community events.

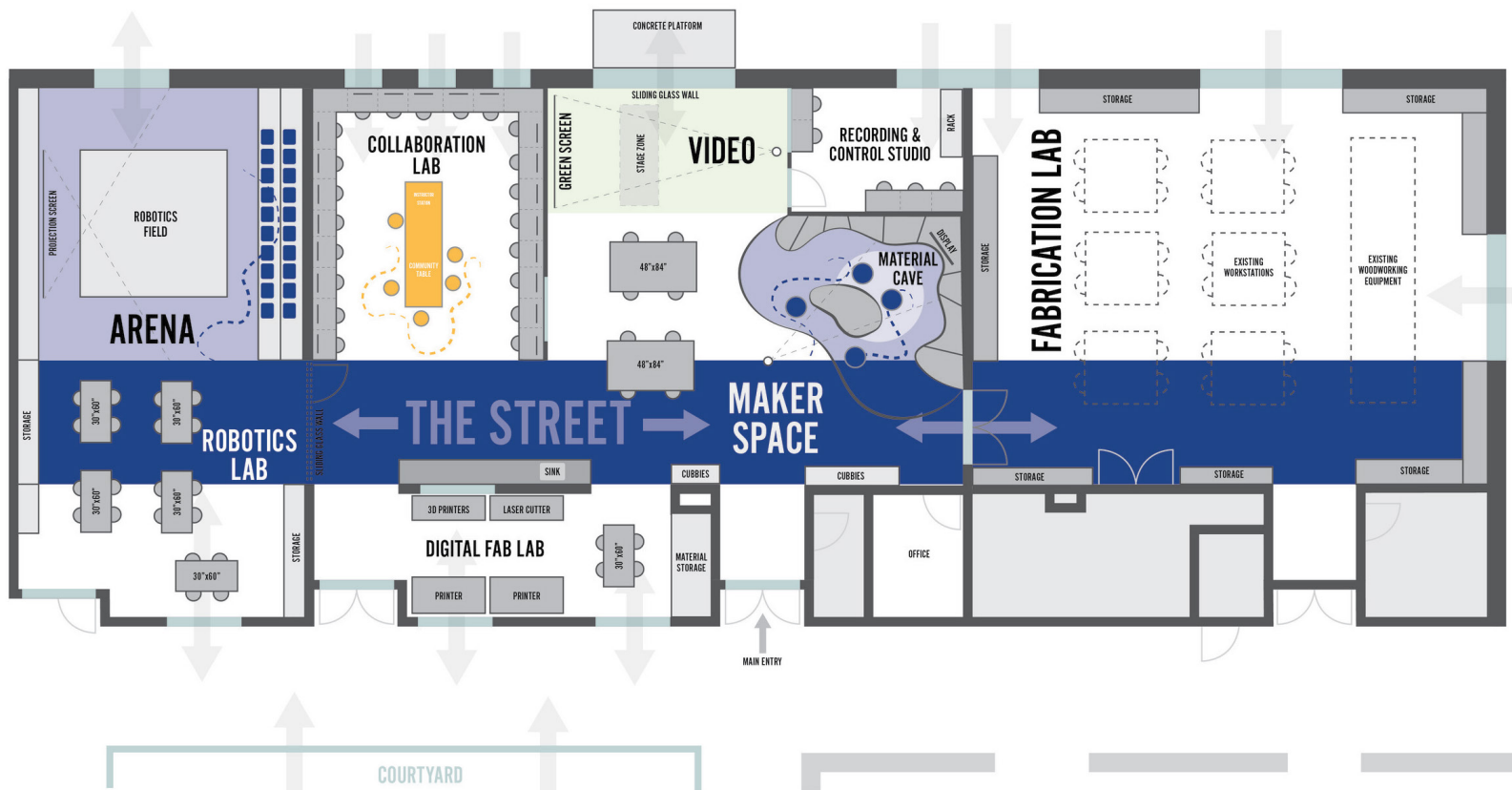
Program elements include a robotics lab and arena, collaboration lab, digital fabrication lab, video production area, material cave, maker space, and an updated wood shop. These are all

connected by the wide, colorful street that runs the width of the wing, allowing for natural circulation and movement that supports the collaboration and creativity at the heart of the space. The street is wide enough for people standing in the space to see the whole wing buzzing with activity and establish visual connections between different groups working away at their projects.

These internal connections encourage users to explore each distinct space,

where they’ll discover a CNC machine, a 3D printer, high-speed computers that are home to the district’s new e-sports teams, flexible, open-shelf storage space in the maker cave to encourage people to take an interest in one another’s projects, and even bleachers lining the robotics arena to allow spectators as this new sport grows in popularity.

New windows along the corridor allow for views into the space, inviting students in as they pass by.



ESPORTS

One of the most significant additions is the e-sports space, home to the district's brand-new junior varsity and varsity e-sports teams. This element is multifunctional: it calls in students who have traditionally been isolated by the solitary nature of video gaming, giving them opportunities to participate and socialize, building social-emotional skills, and helping with hand-eye coordination, problem solving, collaboration and even can even result in improvements in academic performance.



MATERIALS MAKE THE DIFFERENCE

What was once dark and unwelcoming has become open, thanks in large part to the materials chosen for the space. Glazing on the exterior window allows access to daylight, views, and the adjacent corridor and courtyard beyond, creating a broader sense of community for people using the STEAM Wing and capturing the interests of passersby.

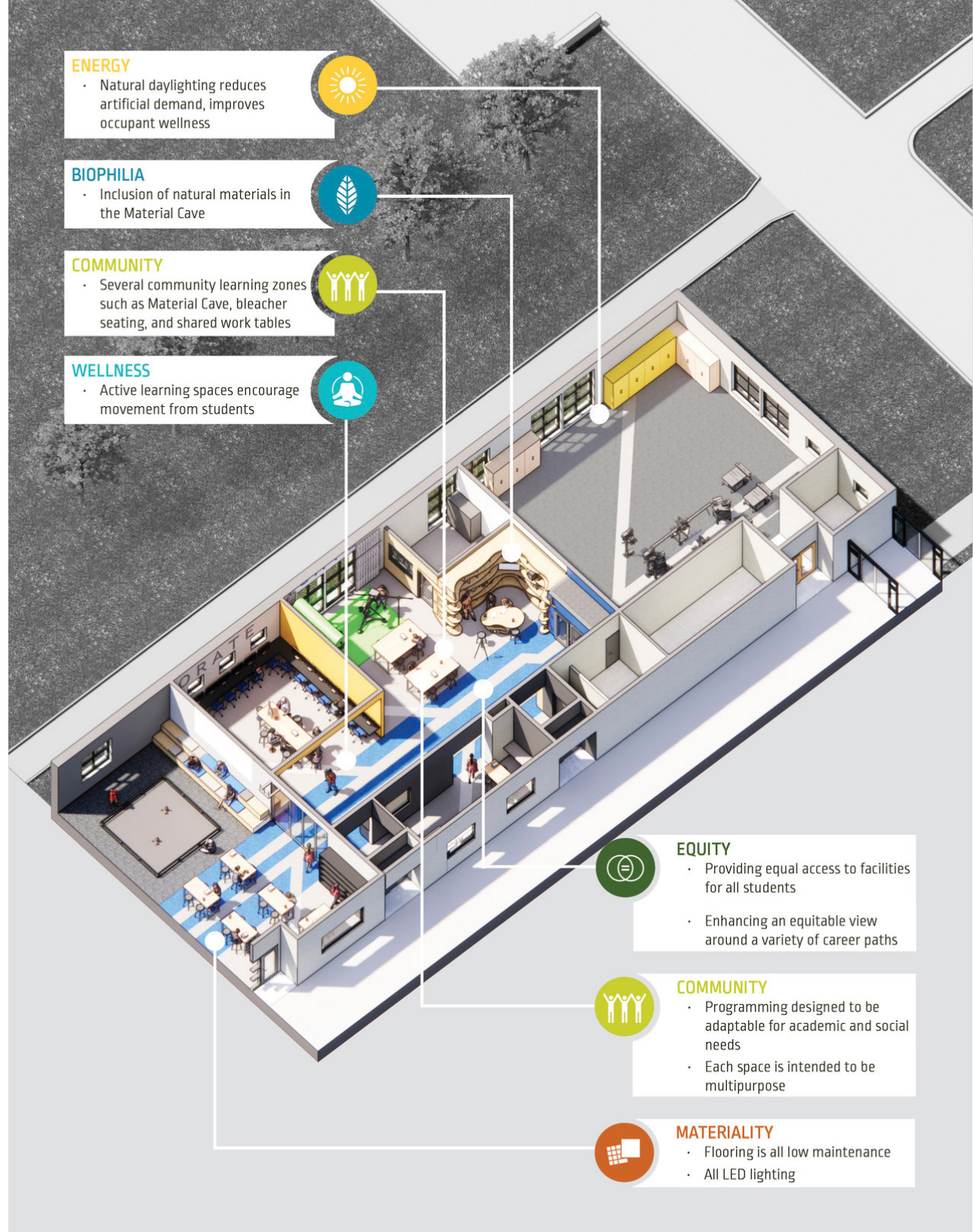
The daylighting increases the usability of the space; traditional wood shops, mechanics classes, and other STEAM-related pursuits tend to be held in windowless or low-light areas, but sufficient daylighting is essential for student well-being. Combining the external glazing with interior glass partitions creates an openness throughout the space. Daylighting not only has a positive effect on students' mental health, it has also been shown to increase academic performance.

The bright blue and yellow of the school's official colors run the length of the street, helping with wayfinding and a sense of active engagement. Details like plywood make up the undulating shelves of the material cave and are essential to creating and reinforcing the space's identity. The finished plywood is a durable, playful nod to the works-in-progress being created in the space, informing students that this is a place to learn, but also to play and have fun.



SUSTAINABILITY & WELLNESS

Non-toxic and natural materials were used throughout the space. Selective incorporation of wood creates a sense of warmth and connection to nature. Large windows bring in natural daylight and allow for views to the landscaping beyond. Durable materials were selected to ensure longevity of the space, even in a high traffic environment.



ENERGY

- Natural daylighting reduces artificial demand, improves occupant wellness

BIOPHILIA

- Inclusion of natural materials in the Material Cave

COMMUNITY

- Several community learning zones such as Material Cave, bleacher seating, and shared work tables

WELLNESS

- Active learning spaces encourage movement from students

EQUITY

- Providing equal access to facilities for all students
- Enhancing an equitable view around a variety of career paths

COMMUNITY

- Programming designed to be adaptable for academic and social needs
- Each space is intended to be multipurpose

MATERIALITY

- Flooring is all low maintenance
- All LED lighting

RESULTS

When developing the 2020-2023 strategic plan, NHSD stated: All students' unique abilities and needs should be respected, recognized, and supported. We should strive to make learning integrative, inquiry-based, and problem-centered. Technology should be a learning tool, which should change the manner in which we access and share information, as well as how we teach and learn. [NHSD] will support innovation, inclusion, and authentic personalized learning while fostering the development of the whole student.

The STEAM Wing has officially been open as of February 2023, and it is fully utilized from first period through after-school activities. NHSD has reported an explosion of sign-ups for new engineering, robotics, materials, and multimedia classes, stating that their students are energized and ready to explore.

Their newly formed e-sports teams started practicing in their individual homes in the fall, but they're now making full use of their new homebase. Several students have also, under the tutelage of their teachers, started designing and creating the signage for the wing using their new state-of-the-art CNC machine, learning design skills that they might otherwise have had to wait until undergraduate or even graduate studies to start learning. NHSD officials are now considering how to expand the space's uses to meet demand.

The STEAM Wing was built to engage and excite students, and it's already doing just that.

"We are incredibly excited about this new space and all of the potential it holds for our students. The kind of learning we can facilitate in this space will help students develop essential skills for their future: how to create, question, collaborate, and problem-solve effectively,"

- Dr. Amanda Benolken
New Hope-Solebury School District Director of Education

