

NORTH CREEK HIGH SCHOOL

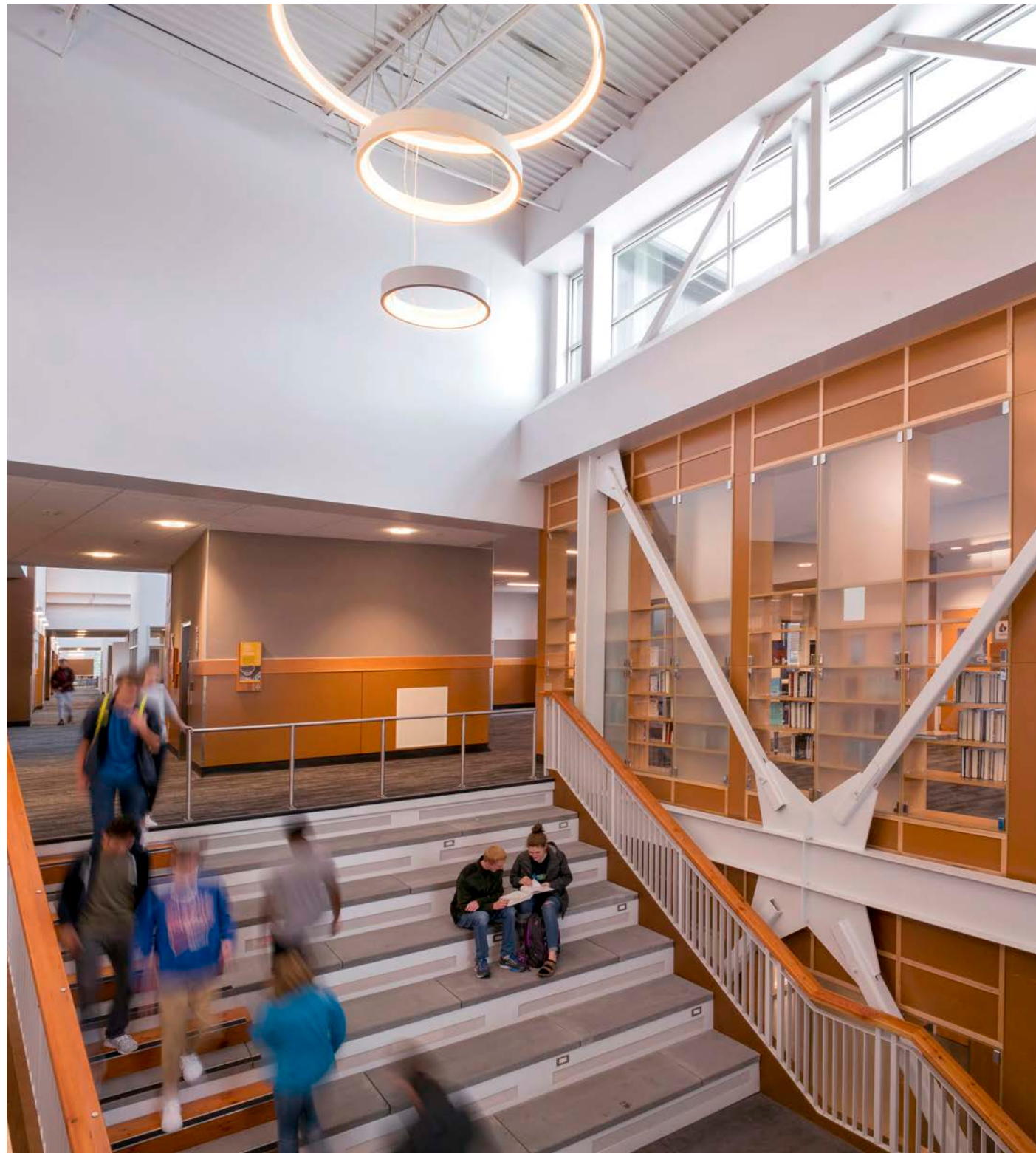


Overall Goals

In response to explosive growth in some areas of the school district and uneven enrollment in others, the owner determined that the addition of a fourth high school and a grade reconfiguration effort would provide the opportunity for additional instructional space and realignment across the District. This created opportunities around curriculum, partnerships, and instructional practices. District leadership assembled a team of business leaders, educators, and design professionals for a series of visioning and educational specification meetings to explore **instructional program opportunities** and **design innovations** for this comprehensive high school. Visioning consisted of five half-day sessions held over five weeks; with over 30 participants from various segments of the community around the table, the team was able to dialogue in an open and free format - sometimes with significant disagreement - about how K-12 education should be evolving.

Outcomes

The results of this visioning process were **innovative** and **far-reaching**, and challenged the team to create a school that provides learning experiences at every step, inspires exploration, and stimulates the senses while balancing a celebration of nature and culture. These conversations resulted in a clearly distilled vision: North Creek High School would be focused on sustainability, supporting 21st-century learning and beyond, with classrooms extending beyond the building. In addition, a STEM focus would incorporate high-demand fields of study and career opportunities, enabling students to experience real-world application of knowledge and skills.





OCCUPANCY IN
SEPTEMBER 2017

GRADES **9-12** 

FINAL CONSTRUCTION COST

\$90,780,162

 **1600**
STUDENT
CAPACITY

225,000 SF

 **BUILDING
AREA**

SITE AREA

61
ACRES

PROJECT DELIVERY

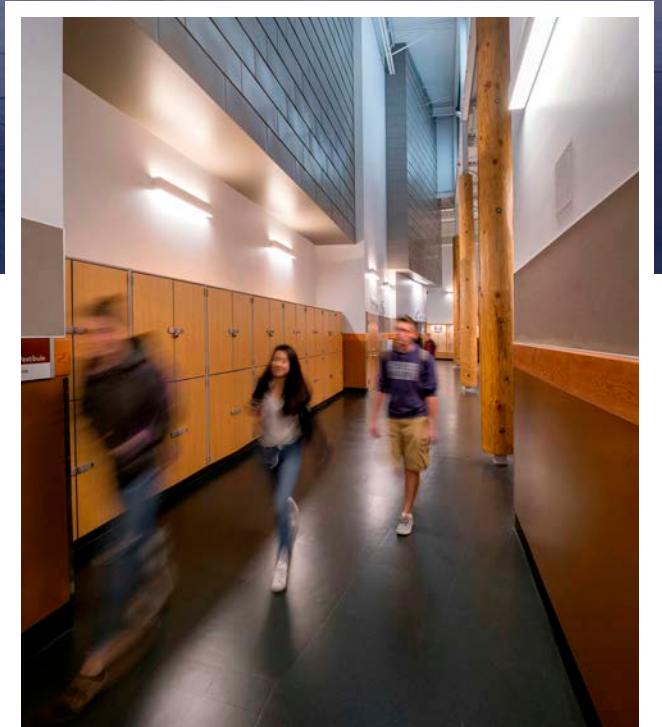


GCCM



Engaging the North Creek Community

The idea for a new high school was born out of a need to relieve capacity and enrollment pressure within the district. Located at the far north end of the district in the Snohomish County portion of Bothell, WA, the area has experienced **unprecedented growth** over the last decade. The 61-acre property where the school now stands was one of few remaining of its size in the area, with residential developments sprouting up around it. With a large number of local businesses focused in the technology sector, including biotechnology, software, and engineering, a **comprehensive high school with a STEM focus** was a natural fit for this diverse community.



Challenges

While the long-term plan of establishing a new high school would eventually assist with capacity issues, the addition of North Creek High School brought with it a myriad of challenges for the district and the broader community. The district would not only have to implement a district-wide grade reconfiguration, but also make service area boundary adjustments as well. At the time, the three existing high schools served grades 10-12; the addition and reconfiguration resulted in four comprehensive high schools serving grades 9-12. The initial community response was not always favorable; high school alliances ran deep in some families. In addition to switching schools and being separated from friends, students whose educational career path would have previously directed them to a particular school found themselves uneasy about the prospect of attending a new one.

The owner **met these challenges head on**, with careful consideration and planning. Committed community members helped to form enrollment demographic and capital bond planning task forces; coupled with strong leadership at the administrative level, these groups put in the work needed to get the new high school onto the 2014 bond. With community approval of the bond by a healthy margin, the development of a new high school became a reality.

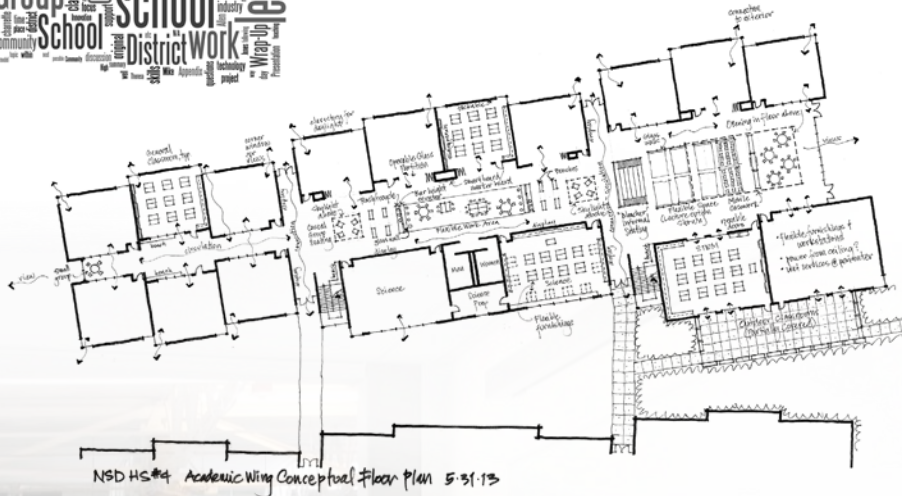
Assets

Though challenging, this project also had several intriguing benefits. Adding a new 9-12 comprehensive high school significantly increased capacity for offering higher-level, more specialized courses accessible to all students; created a teaching and learning alignment with national and state standards; provided access to counseling that addresses high school and beyond across the full four years of a student's career; and increased opportunities for 9th graders to participate in sports, activities, and additional electives and college readiness courses. Additionally, the opportunity to develop a brand-new high school was unique, and the school district intended to take full advantage of this with the execution of a thoughtful visioning process.

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The ability to bring a planning principal on early in the design process ensured continuity of leadership and the creation of a culture that would support the district's vision. As part of the early work of generating excitement with future North Creek students, a committee of 60 middle school students selected the jaguar as North Creek's mascot and purple and silver as the school colors. In addition, students toured the campus during construction to get a feel for their future high school environment.





Stakeholders

The goal of the Visioning Team was to engage in conversations that explore the link between instructional program opportunities, facility design, and career pathways for future students. In addition to district administrators, educators and design professionals, participants included students and key business and industry partners, such as McKinstry, Washington STEM, Washington Workforce Development, higher education leaders, and the biotechnology sector. Feedback from these industry leaders revealed that education and STEM, in particular, are workforce/pipeline issues of real significance to employers.

Some of the essential questions that were asked of the Visioning Team included:

- What are the **skills and experiences** students need to thrive in a global 21st century economy? What role does personalization play in the acquisition of these skills?
- What are the **physical and geographical characteristics** of a learning environment that facilitates development of these skills?
- How would **real world relevancy** inform the high school curriculum?
- How can we prepare students for **careers that don't yet exist**?
- How can we design schools that remain **technologically relevant** for the next 50 years?

These results of this process were developed into the following 'What We Believe' concepts about this new comprehensive high school:

- Focus on **sustainability**
- Facility Supports **21st Century Learning** and beyond
- 'Classroom' extends **beyond** building structure
- Partner with **industry** and higher education
- **Professional development** site
- **STEM** focus

From these meetings and with these 'What We Believe' concepts, the Deputy Superintendent met with secondary administrators and a representative cross section of certificated staff to share this vision and design possibilities for the new school. This group of educators met with the design team and district leadership, continuing the development of the visioning process. Key areas of focus and refinement included the concepts of the library and the learning commons, counseling/career center, performance venue, incorporating the Project Lead The Way (PLTW) curriculum, innovative technology, and the "green school" concept.

Out of this process emerged a vision and a set of guiding principles with regard to school design, instructional models, curricula, programs, and partnerships.



Value of Process + Project to Community at Large

The Vision and Guiding Principles established a road map for design, providing a filter through which all decisions were vetted:

- The new school should have a **flexible and innovative** design that allows for collaboration among staff and students. The integration of disciplines will occur through the use of project-based and problem-based learning.
- The staff, students, and community of the school should develop a culture **deeply invested in sustainability** and utilize the facility and campus as learning tools.
- The 'classroom' should extend **beyond** the building footprint.
- There should be a STEM focus that incorporates **high-demand fields of study** and career opportunities.
- **Real-world application of knowledge** and skills should be incorporated into the curriculum, and the acquisition of these skills should be an integral part of the new comprehensive high school's culture.

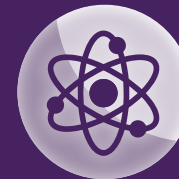
Four key guiding principles influenced the planning and development of North Creek High School:



Innovative Design + Learning



21st Century Learning + Skills Outcomes



STEM + Career College Readiness



Partnerships



Innovative Design + Learning

There were two areas of focus for innovative design at North Creek High School. One focus was on “deep green” design with a high level of sustainability, including the challenge of attaining significant water and energy conservation. The second area of focus was extending the learning environment **beyond** the walls of the building itself.

Innovative design concepts include:

- Geothermal energy harvesting
- Comprehensive building envelope enhancements
- Raingardens
- Stormwater management

The goal was to positively impact the carbon footprint of the school and to provide opportunities for students, staff, and community members to study and monitor the soil systems, habitat, both surface and subsurface hydrology, and the microclimates of the site. Through a variety of small demonstration projects incorporated into the school’s design, the district promotes the study of a variety of environmental subjects:

- Alternative energy generation
- Greywater recycling
- Wetland conservation and maintenance
- Edible landscape
- Utility auditing

Inside the buildings, there are a variety of sizes and types of spaces that encourage the collaboration of students and teachers, integration of disciplines, project-based and problem-based learning, reflective thinking, and large presentations.

Ultimately, the goal was to break away from traditional design and structure of a school with isolated workspaces and areas for department so that collaboration and teamwork became the norm. **Integration of the community** and local industry resources is a large part of North Creek High School’s culture, which encourage partnerships in order to support internships, externships, and local expertise to support student learning and development.





21st Century Learning + Skills Outcomes

In order to succeed in work and life in our modern global economy, high school students should not only experience and master core academic subjects, but should also learn and develop essential skills of critical thinking, problem solving, collaboration, and communication. At North Creek High School, there is a strong focus on weaving **interdisciplinary themes** into the academic curriculum:

- Global awareness
- Financial, economic, business, and entrepreneurial literacy
- Civic literacy
- Health literacy
- Environmental literacy

Students are engaged in the learning process, connected to **real-world applications of learning**, and have opportunities to develop a range of functional and critical thinking skills essential to information, media, and technology literacies.





STEM + Career College Readiness Focus

All high schools within the district have a STEM focus; what sets North Creek apart is its **specialized focus** on biomedical and environmental engineering. The school site, local industry, and higher education partnerships provide a suite of resources for this STEM pathway of study. UW Colleges of the Environment and Biomedical Science and WSU College of Environmental Engineering offer high demand fields of study and potential partnerships to develop Career College Readiness programs for NCHS students. STEM is integrated into a variety of subjects through the use of instructional strategies such as project- and problem-based learning.

With Fernwood Elementary School adjacent to North Creek High School, the district has the unique opportunity to develop and implement a program and certification in early childhood education, a growing field of study not offered at any of other high school in the district.



Partnerships

Local industry, community groups, and higher education institutions are critical partners for students and staff at North Creek High School. By cultivating these partnerships, meaningful **collaborative relationships** are able to develop and thrive. These partners support real-world application of learning and potential internships for students and staff, and have become an integral part of the North Creek community.

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Supporting the Curriculum

- The district's adoption of **Project Lead the Way Curriculum** - which focuses on the real-world application of knowledge and skills - is supported by the Pre-engineering Lab, Engineering STEM Lab, and Bio-med Lab.
- Nestling the art wing next to engineering and computer labs ensures that **science and art are integrated**.
- An innovative Performance Studio allows for a **variety of performance approaches** - an operable wall, flat floor with retractable seating, and overhead tension grid allows for configuring the performance space as a traditional proscenium stage, thrust stage, theater-in-the-round, or black box.
- The centrally-located student store's adjacency to the business and marketing classrooms provides an opportunity for **hands-on learning**.

Supporting a Variety of Learning + Teaching Styles

- Spaces allow for **adaptability** of teaching and learning styles, curriculum development, and collaboration.
- Spaces of varying sizes, including **collaboration and breakout spaces**, allow for individual as well as group work.
- **Infrastructure and technology** provide multiple display opportunities within each space, and allow for flexibility with regard to room orientation.



"We want every space on this campus to be a learning environment."

- Dr. Eric McDowell, NCHS Principal

Adaptable + Flexible Environment

- **Flexible** furnishings allow the environment to be “hackable,” yielding student ownership of their own collaboration and educational environment.
- **Movable** glass walls allow for classrooms to spill out into central common areas if needed.
- A **transparent** ‘book wall’ breaks the traditional mold and serves as an extension of the two-story library, reinforcing the concept that learning can and should occur in every space within the facility. It doubles as a space to display and celebrate student work.
- An **expansive** set of seating tiers, dubbed The Forum, sits adjacent to the book wall opposite the library, and functions as a gathering area or lecture hall for up to three classes worth of students at a time.



Site Design

There were several features of North Creek High School's 61-acre site that influenced the design of various school elements. These included a large central wetland complex as well as a series of wetlands stretching along the eastern edge of the site. In addition, the site was bisected by an Urban Growth Area (UGA) boundary line, limiting development requiring utilities to the west side. This required situating the athletic complex east of the UGA line, leaving the area surrounding the central wetland complex available for buildings. Retaining and enhancing the wetlands creates an opportunity to teach students and community members about how the school interacts with the ecology of the site. **The design team treated the wetland complex as a focal point** – the classroom wings and plaza all focus views to the central wetland system. A boardwalk connects one side of campus to the other, and a platform in the center serves as an outdoor classroom.

To emphasize its image as a **civic amenity**, the site frames the building's main entries and important features, including entry plazas, courtyards, outdoor classrooms, and pedestrian footpaths. The overall school design fortifies its social and academic functions by creating

spaces that communicate a strong sense of civic pride. All buildings spill out onto the central plaza, which serves as a gathering space at the heart of campus. Positioned directly outside

Retaining and enhancing the wetlands creates an opportunity to teach students and community members about how the school interacts with the ecology of the site.

of the Commons, it includes an amphitheater and seating and is used throughout the day for both lunch and classroom activities. Additional site features include rain sculptures and rain gardens, an accessible green roof, sustainable landscaping, and walking paths.





Building Design

Spaces within each building are oriented along a spine that radiates outward from the center of campus. These spines take the form of two-story circulation and common spaces flanked by program areas. Daylight streams into the common areas from clerestory windows, and a **connection to nature** is maintained by views toward the wetland and hillside meadow.

The common space contains "collaboration cubes": small, glazed rooms outfitted with whiteboards and flat

panel displays, each one named after a pair of famous collaborators. The cubes alternate with large, open collaboration spaces filled with flexible furniture and writable surfaces. Operable glass walls in adjacent classrooms allow students to spill out beyond the classroom for group and individual work. Wireless infrastructure throughout supports bring-your-own-device capability, and standing height tables with integrated charging punctuate the length of the building. Flexible maker spaces accommodate forward-thinking course design such as engineering, biomedical science, and more.

A connection to nature is maintained by views toward the wetland and hillside meadow.

Paired science classrooms provide for peer collaboration, while simultaneously being positioned adjacent to general education classrooms to accommodate interdisciplinary teaching. Teacher planning areas are situated just off the common areas, affording connectivity as well as supervision and, as classroom utilization rates fluctuate with enrollment, ensure that every staff member has a landing spot.



Sustainability

Sustainability goals for the project included significant water and energy conservation, as well as prioritizing building materials that were sustainable and locally sourced in order to minimize the school's carbon footprint. Care was also taken to ensure that the site design included elements - from stormwater use to native landscaping choices - which focus on the **reduction of resource use** and maintenance costs.

There are 112 geothermal wells under the student parking lot that provide heating and cooling for the buildings. The **310 solar panels** on the roof of the Commons provide 100,000 kilowatt hours of electricity per year. Two large concrete vaults buried at opposite ends of the campus provide stormwater retention and infiltration.

Energy efficient systems include plug load management and LED lighting, and the buildings are oriented such that the majority of classrooms are north facing, allowing for **maximum natural lighting**. A low velocity air-displacement system delivers heating and cooling, and occupants benefit from natural ventilation via operable windows. Combined with a highly efficient building envelope, North Creek is poised to be the most energy-efficient high school in Washington State.

Recyclable, renewable, and reclaimed materials are used throughout the North Creek facility, and include FSC as well as site-harvested wood. Trees from the site were milled to create benches, window seats, handrails and paneling. In the Commons, structural columns are wrapped by 20' tall logs, providing a visual reminder that they once stood on the site.





The Project in the Context of the Larger Community

As North Creek High School has grown, so has the surrounding residential community. Athletic fields, walking paths, and open spaces are a **significant community resource**, allowing for recreation and connectivity between neighborhoods. Thoughtfully designed low-maintenance landscaping frames courtyards and enhances the natural habitat. To welcome visitors, entry plazas contain whimsical stainless-steel chairs of varying shapes and sizes - these were made possible through the Washington State Arts Commission public art program. Within the buildings, zoned spaces allow for community access for after-hours activities. A small kitchen adjacent to the Commons supports curriculum as well as community events.

Interpretive Program

North Creek High School



Energy



Life



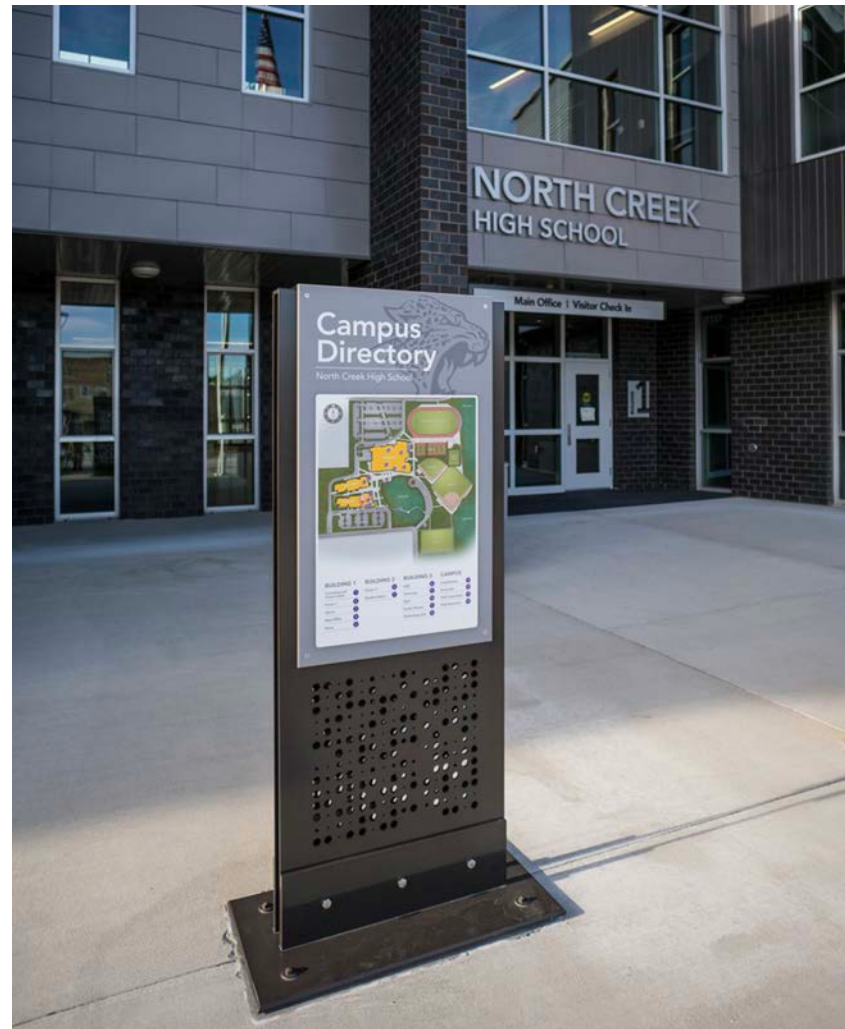
Water



Materials

Look for these symbols throughout the campus.

Multiple interpretive boards are located throughout the school's campus. Organized into four major themes, these boards indicate sustainable features and how the buildings and site function as a critical educational tool.



How the Project Inspires + Motivates

The openness and transparency of the spaces at North Creek are key to creating connection among students and staff and encourage a culture of collaboration and innovation. Visibility into educational spaces puts programs on display and spurs curiosity, encouraging students to consider the various course offerings. Student work is shared and celebrated: tack surfaces and display cases are arranged in a gallery-like fashion throughout the buildings, and storage cubbies in the Engineering STEM lab are visible through windows into the Commons, highlighting student projects.

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Building on the theme of the **building and site as teaching tools**, an interpretive signage program throughout campus communicates school values of sustainability and community. Multiple interpretive boards are located throughout the school's campus. Organized into four major themes, these boards indicate sustainable features and how the buildings and site function as a critical educational tool. In this way, nature and the environment are integrated into the curriculum.

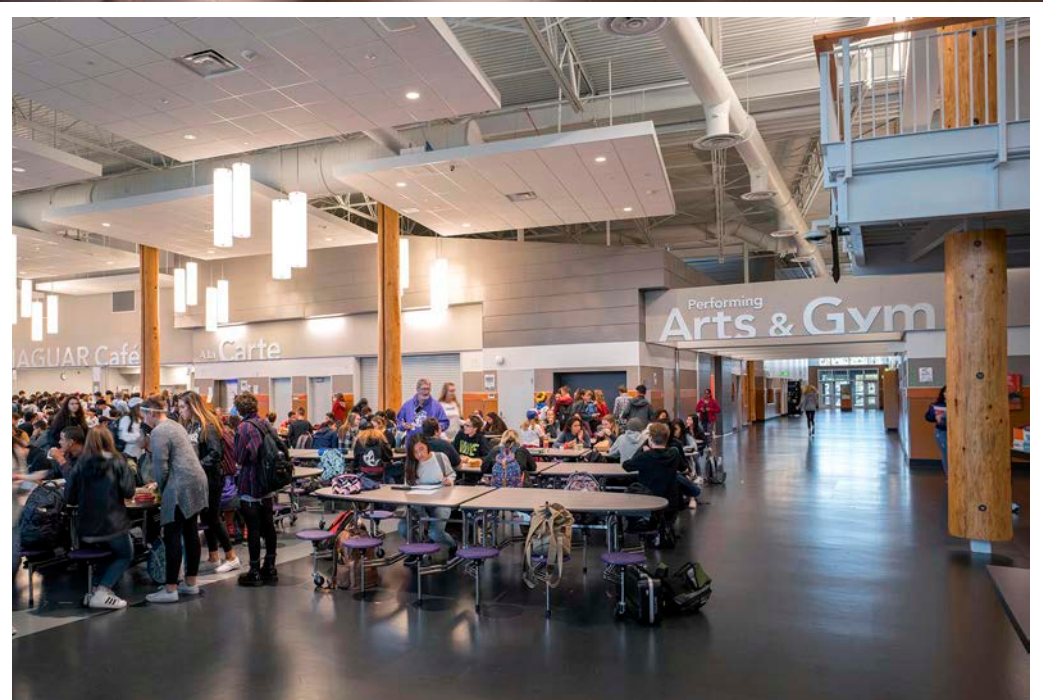
Additional elements include rain sculptures outside of the Commons that relay values messaging derived from the Educational Specifications, and mascot-themed graphics on the curtain wall of the Commons that instill pride in the student body.





How the Project Achieves Educational Goals + Objectives

The result of this in-depth community engagement and sustainably-focused design process is **North Creek High School**, a comprehensive new high school with a focus on STEM and project-based learning, and a goal of achieving deep green design. All of these elements come together to provide a space which exemplifies the owner's principles of **durability, sustainability, and lifelong learning in the 21st century**. North Creek High School has become a model for innovative learning, ensuring that every student has exposure to rigorous and inspiring experiences that help them connect their education to their future potential.



How the Project Achieves School District Goals

In early 2019, eighteen months after opening North Creek High School, the district was presented with an incentive rebate in the amount of \$420,000 by Snohomish County Public Utility District (SnoPUD) in recognition of the school building meeting high energy efficiency markers. The energy savings for North Creek is expected to be **2.3 million kWh** or a cost avoidance of around \$270,000 savings a year. This savings is equal to:

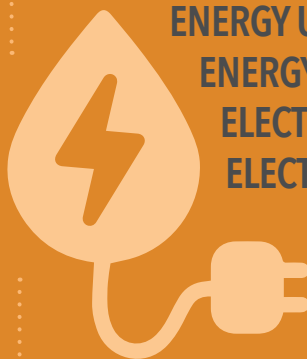
- Powering **203 average homes** within Snohomish County.
- Powering Canyon Park Middle School, Fernwood Elementary and Skyview Elementary **for a year**.

SUSTAINABILITY +
ENERGY SAVINGS

\$147,492
COST AVOIDANCE TO DATE

80 ★ ENERGY
STAR
SCORE

ENERGY USE INDEX 34
ENERGY COST INDEX \$0.69
ELECTRICITY EUI 24
ELECTRICITY SAVINGS 8%



WATER SAVINGS
11,716 CCF



CARBON
REDUCTION

570
mtCO₂eq

EQUIVALENT TO CO₂
EMISSIONS FROM
64,139 GALLONS OF GAS



How the Project Achieves Community Goals

North Creek High School has become a significant community asset, serving a wide variety of needs for students, their families, and surrounding neighborhoods. It exemplifies environmental stewardship and responsibility, and its many energy-efficiency attributes will benefit taxpayers for years to come. The school is not only a place to gather and learn, but has become a teaching tool in and of itself, providing a hub for activity to the broader community.

From the very beginning of the planning process, community pride - both within the school community and within the broader neighborhood community - was an essential component for the design team to incorporate into the project. Though integrating a brand-new high school community and culture into an established district had its challenges, the result is a campus which will help foster innovative, collaborative, and educated community members for years to come.

