

Buildings for Our Future



Fred P. Hall Elementary School



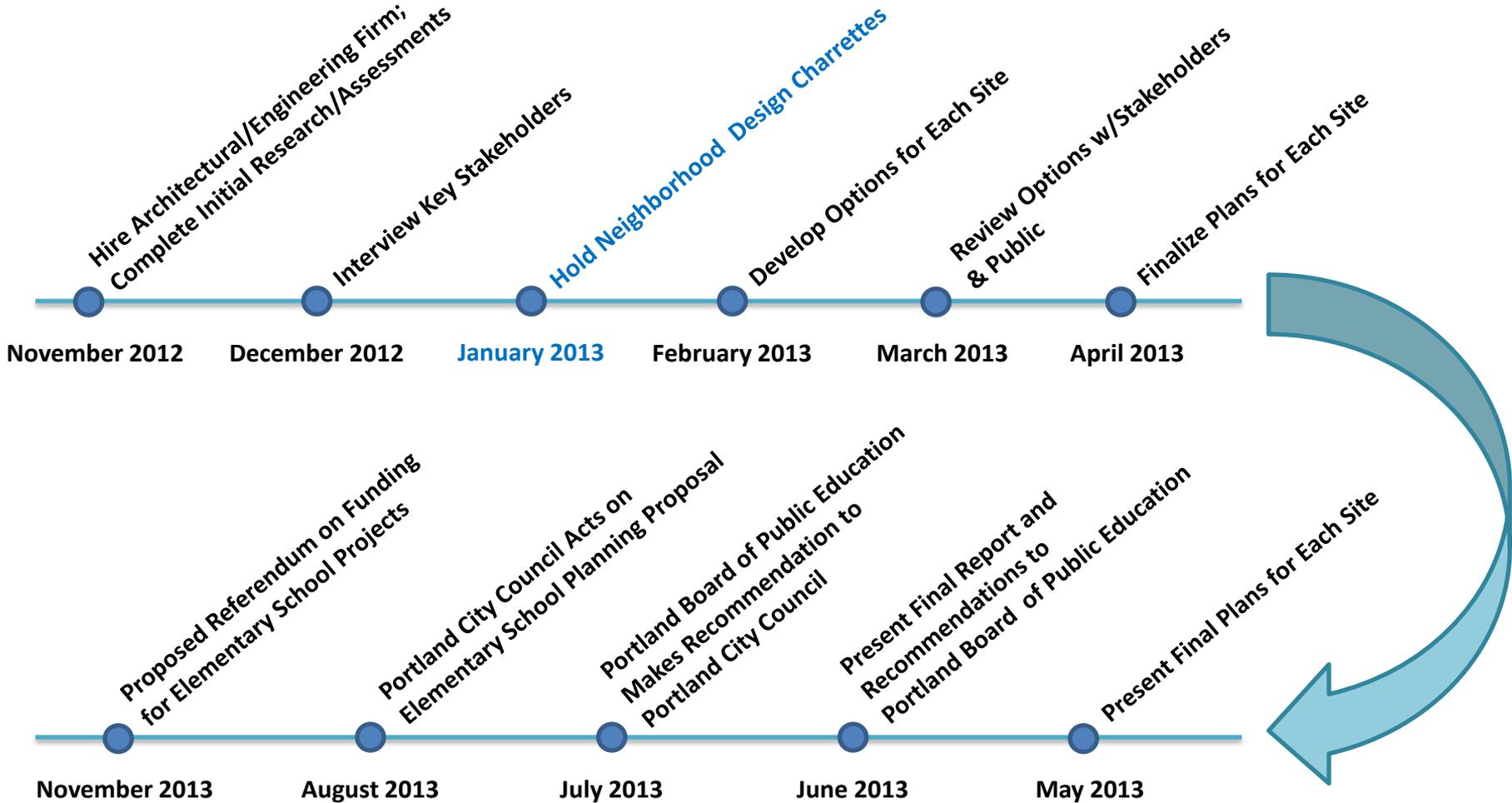
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Buildings for Our Future: Project Goals

- **Develop concepts, cost estimates and construction schedules for replacing Hall School**
- **Develop concepts, cost estimates and construction schedules for modernizing Reiche, Longfellow, Lyseth, and Presumpscot Schools**
- **Evaluate space needs of stand-alone programs: West School, Central Office, Adult Education and Casco Bay High School**
- **Evaluate opportunities to balance numbers across the district, to address chronic overcrowding**

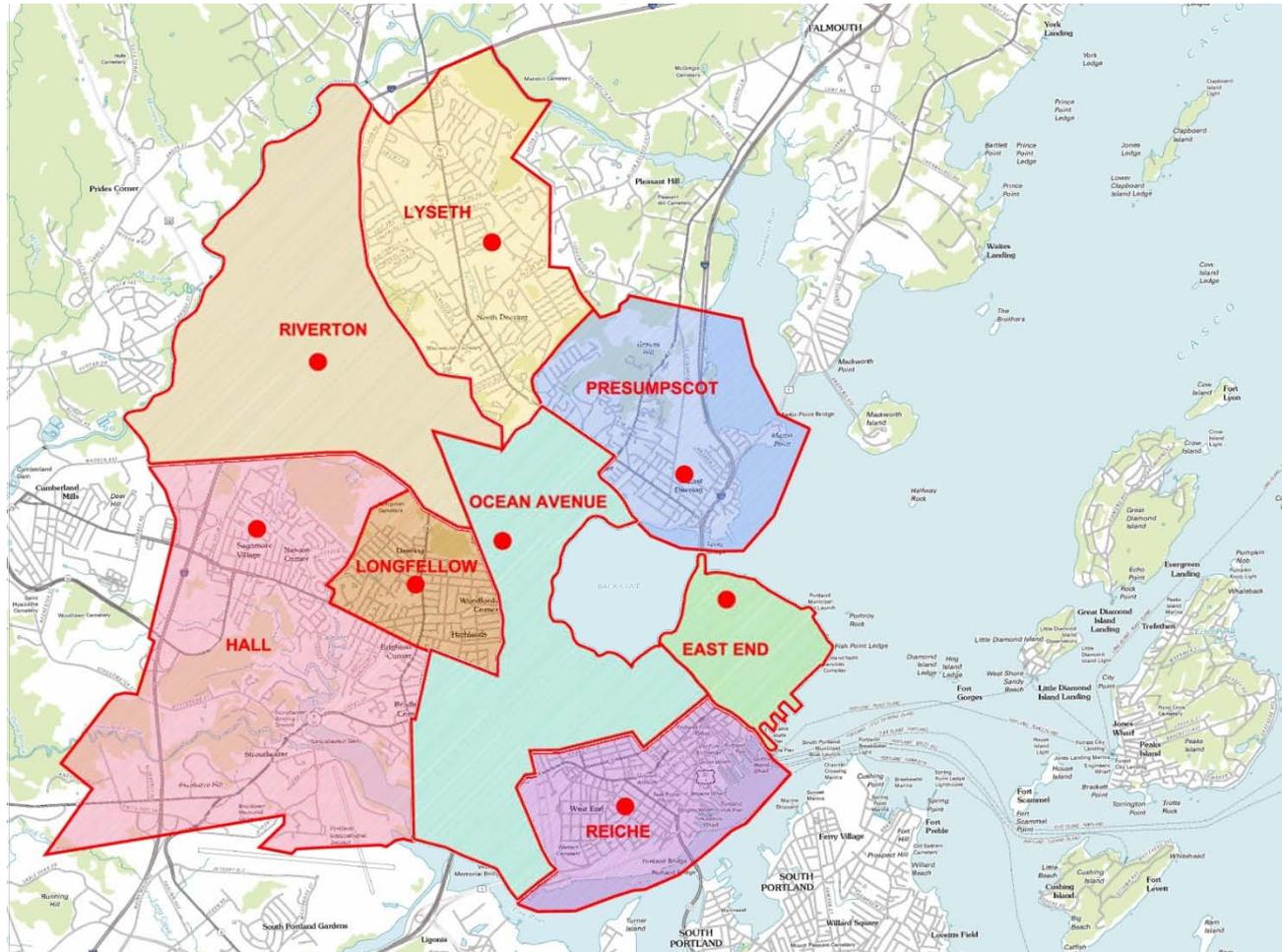
Project Timeline



Priorities for Equity at all Portland Elementary Schools

- Safe, secure, and accessible buildings
- LEED Standards for energy efficiency
- Separate gym and cafeteria
- Performance space/stage
- Small group learning spaces
- Designated support/SPED spaces
- Professional & admin staff offices
- Hands-on learning/discovery lab
- Upgraded data infrastructure
- Adequate parking and circulation
- Outdoor learning and play spaces
- ADA accessible sites
- Library/media center
- Computer lab
- Properly accommodated art space
- Appropriately appointed music room
- ADA accessible shower
- Finishing kitchen
- Individual restrooms for students
- Community/Volunteer room
- Space for new programs/Pre-K rooms

Overall District Plan (Mainland Elementary Schools)



Fred P. Hall Elementary School



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Hall School Site



- **Parcel Size: 21.3 Acres**
- **Site Benefits:**
 - Predominantly Flat
 - Suburban
 - Easily Accessible
 - Largely Undeveloped
- **Potential Site Constraints:**
 - Utility Easements
 - Capisic Brook
 - Irregular Shape
 - Existing School Facility

What Makes A Great School?



“What is the classroom of the future? It’s flexible in furniture and format. It’s loaded with technology that assists the learning process. It’s an extension of the outdoors. It’s a community space. It’s designed for independent or collaborative work. It’s not going away.

Understanding that learning occurs in all places and at all times, the classroom serves– and will continue to serve– as a facilitator of learning. It’s a critical space for guided learning and social interaction for students of all ages.”

-Ellen Kollie, SP+M, March 2011

What does student-centered learning look like?

Flexibility of Space and Time

Learning takes place outside of school walls and school hours

Integrated technology

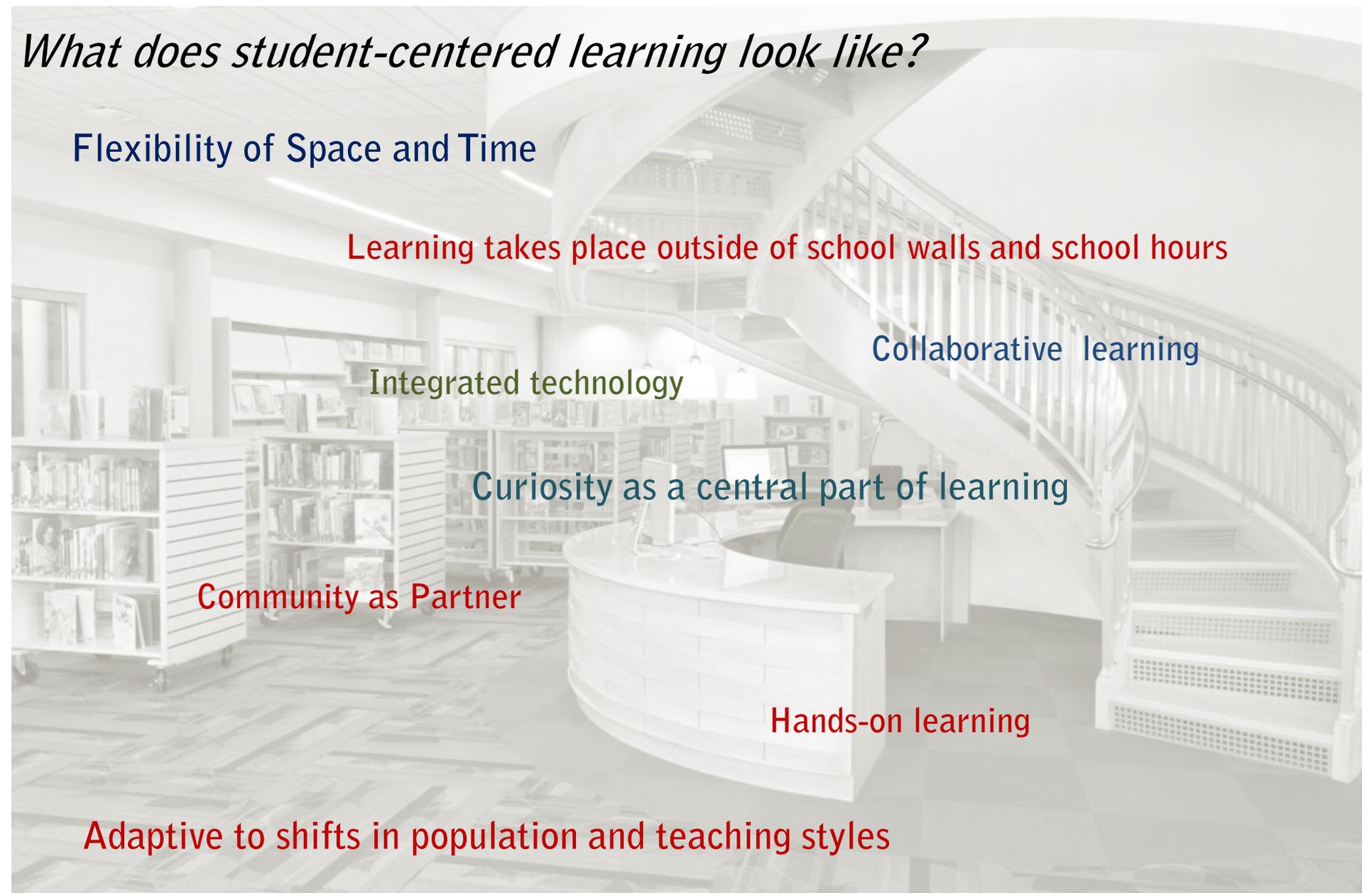
Collaborative learning

Curiosity as a central part of learning

Community as Partner

Hands-on learning

Adaptive to shifts in population and teaching styles



School Grounds

- Spaces for both active and passive recreation
- Play and learning spaces that foster whole child development
- Place-making decisions that are sustainable



Site Circulation

- Adequate staff and visitor parking
- Safe student drop-off and pick-up areas
- Intuitive and accessible site circulation patterns



Safety and Security

- Visibility at main entrance



Core Spaces

- Separate gym and cafeteria
- Performance space/stage



Flexible learning spaces

- Allows for both collaborative and independent work



Building as a Teaching Tool

WHY BIOMASS?



Carbon emissions from the combustion of wood chips from sustainable sources remain within a closed-loop carbon cycle. When wood burns, in a biomass boiler for example, the captured carbon re-enters the atmosphere. As new trees grow, they sequester carbon from the atmosphere, which remains in the wood until released through decomposition or combustion.

Wood chips are considered a renewable, carbon-neutral fuel source when acquired from waste sources or local, well-managed forests that balance harvesting and growth. In contrast, fossil fuels, such as oil or coal, are considered non-renewable energy sources because they take millions of years to create. Burning fossil fuels leads to a net increase of carbon in the atmosphere.

1

WOOD CHIP STORAGE BIN

The Biomass Boiler System is fueled by wood chips. Wood chips are delivered to the Storage Bin that can hold 60 tons of the fuel, a four day supply during the coldest days of the winter season. When the system requires fuel, a traveling auger feeds chips from the Storage Bin onto the Conveyor Belt.

2

CONVEYOR BELT

Wood chips are delivered from the Storage Bin along the Conveyor Belt to the Metering Bin.

3

METERING BIN

The Metering Bin monitors wood chip levels with an ultrasonic sensor. Metering augers, powered by a variable speed motor, drop chips onto stoker augers that carry the fuel into the boiler, adding the exact amount of chips needed based on computer controlled monitoring.

4

BIOMASS BOILER

Wood Chips are combusted within the Biomass Boiler in a gasification process, and the resulting heat is transferred to water circulating through the system. The boiler has a capacity of 6.8 million BTU/hr, enough to heat approximately 280,000 sqft of building space.

A computer panel continuously regulates and monitors the boiler system, as well as provides facility operator controls.

5

MULTI-CYCLONE ASH SEPARATOR

A Multi-Cyclone Ash Separator spins the exhaust gases to collect fly ash before the gases are released up the stack. This step significantly reduces particulate matter levels, helping generate cleaner emissions.

6

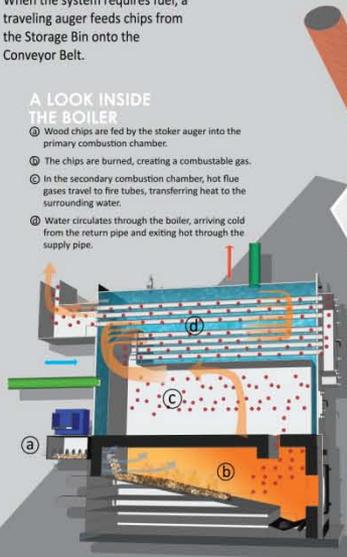
HEAT SUPPLY AND RETURN

Hot water is delivered from the Biomass Boiler through supply pipes to the high school, elementary school, and boiler building. Cool water flows back to the boiler via return pipes for reheating.

For greatest efficiency during shoulder months, heat is supplied to the elementary school from the high school oil boiler.

A LOOK INSIDE THE BOILER

- ① Wood chips are fed by the stoker auger into the primary combustion chamber.
- ② The chips are burned, creating a combustible gas.
- ③ In the secondary combustion chamber, hot flue gases travel to fire tubes, transferring heat to the surrounding water.
- ④ Water circulates through the boiler, arriving cold from the return pipe and exiting hot through the supply pipe.



SYSTEM OVERVIEW

BIOMASS BOILER

- Green: Main supply
- Light Green: Main return
- Blue: Supply to high school
- Dark Blue: Return to Biomass Boiler
- Yellow: Supply to elementary school
- Orange: Return to Biomass Boiler
- Light Orange: Supply to boiler building
- Dark Orange: Return to Biomass Boiler

HIGH SCHOOL OIL BOILER

- Light Blue: Supply to elementary school
- Dark Blue: Return from elementary school

Building as a Teaching Tool



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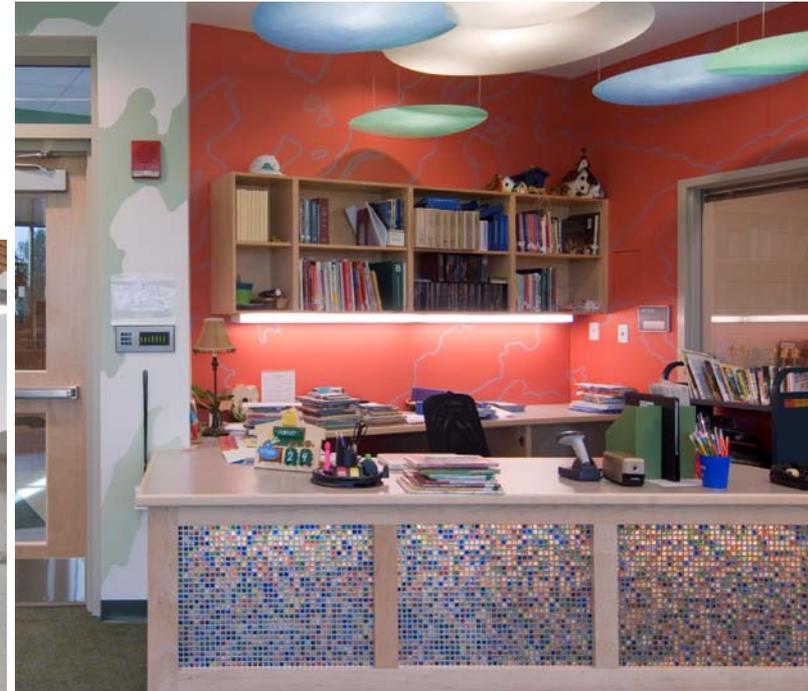


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Fostering creativity

- Percent for Art
- Sensory design



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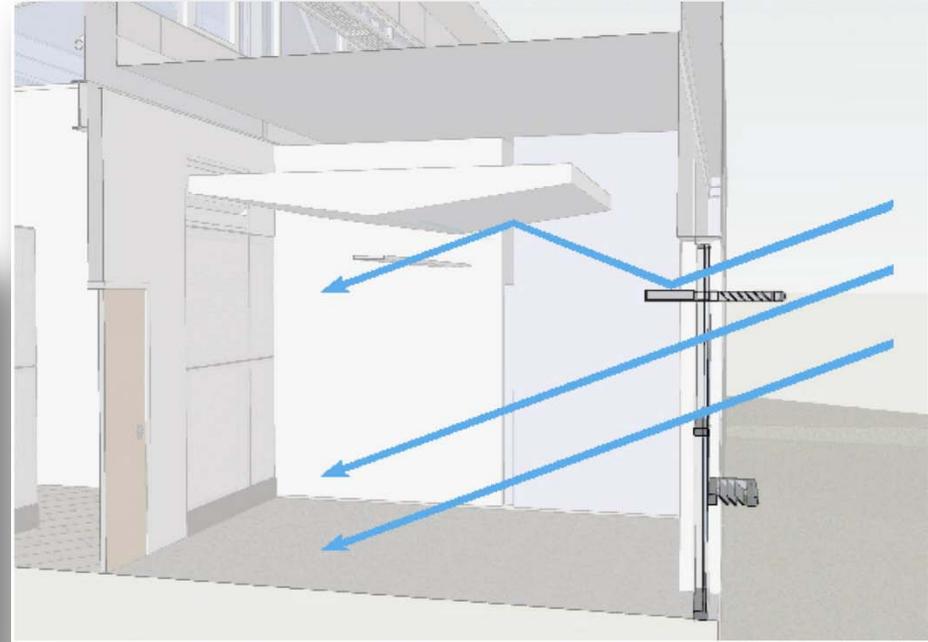
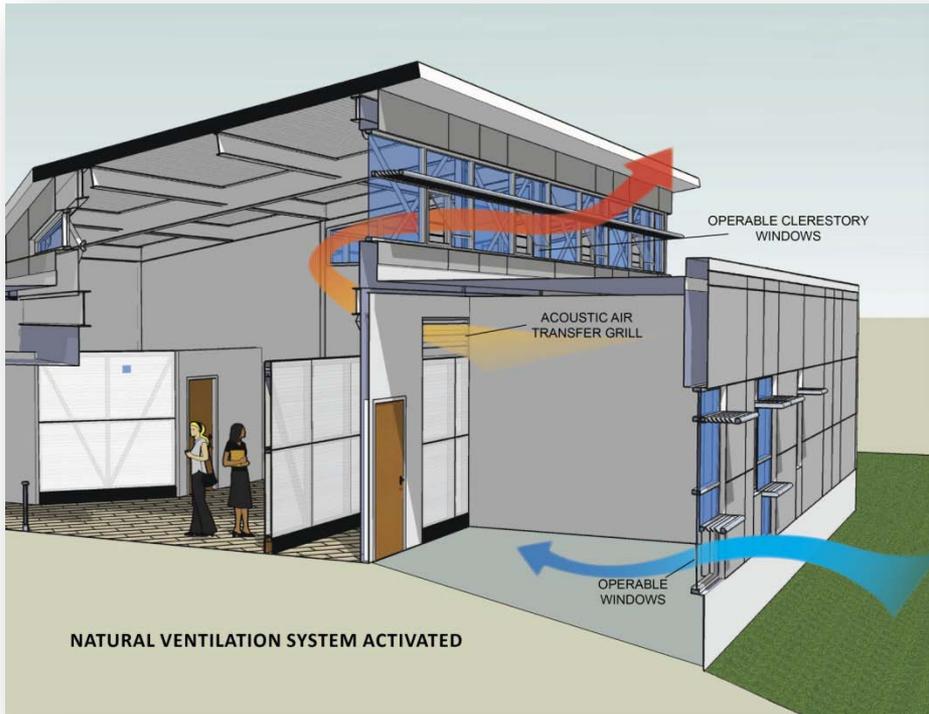
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Finishing Kitchen



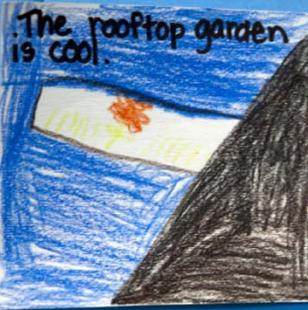
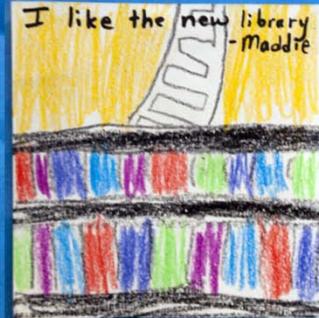
Technology and Systems

- Energy and water-use efficiency
- Indoor air quality and ventilation
- Renewable energy



- Natural daylighting
- Integrated technology
- Enhanced building access control

In their own words...



We want to hear from you....



To stay informed with the latest developments visit us at:
<http://www2.portlandschools.org/buildings-our-future>

To offer additional insight, contact us at:
buildingsforourfuture@oakpoint.com