

Hybrid Learning: Air Quality and Ventilation



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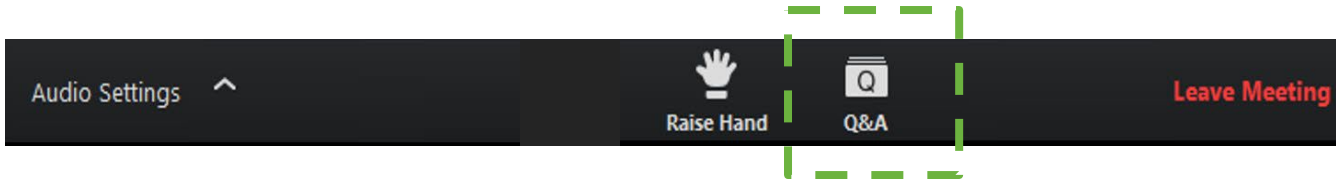
April 2, 2021



Questions



Please type your questions into the Q&A box.





OUR PROMISE

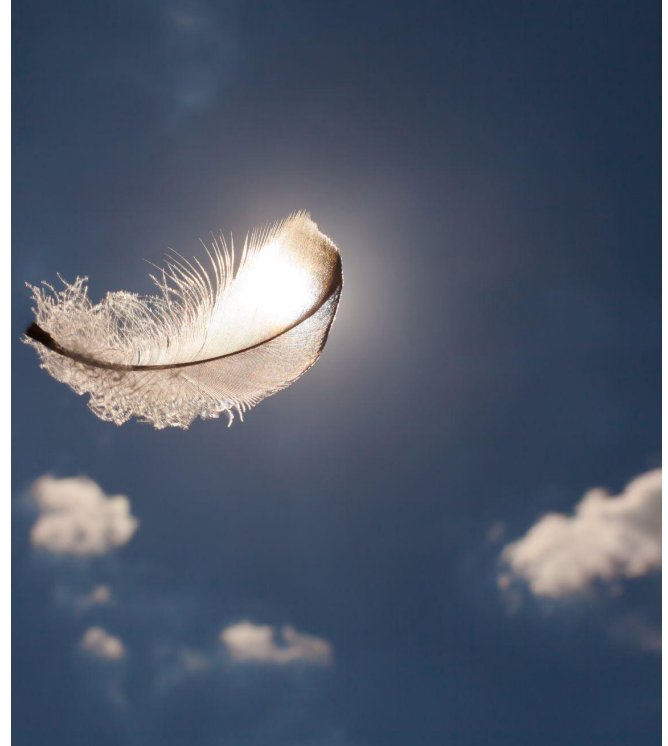
Every student in Highline Public Schools is known by **name, strength and need**, and graduates prepared for the **future they choose.**

Our Guiding Principles

WE WILL...

- **Be guided by Our Highline Promise** to know every student by name, strength and need so they graduate prepared for the future they choose.
- **Follow public health guidelines** to protect the health and safety of students, staff, and families.
- **Engage our families, students and staff to the best of our ability** given the short timeline to understand how to address their needs.
- **Prioritize the needs of students who are most reliant on the educational system.**
- **Provide every student with the opportunity for in-person instruction to the extent possible** within the requirements of public health and safety guidelines.

Air Quality and Ventilation





Unit Ventilator



Heating Pump



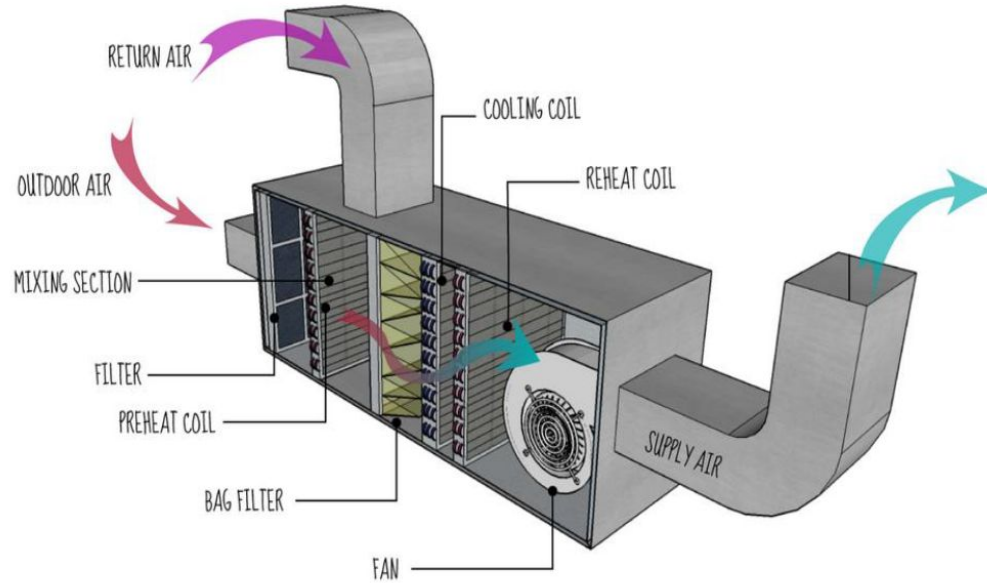
Air Handling Unit (AHU)



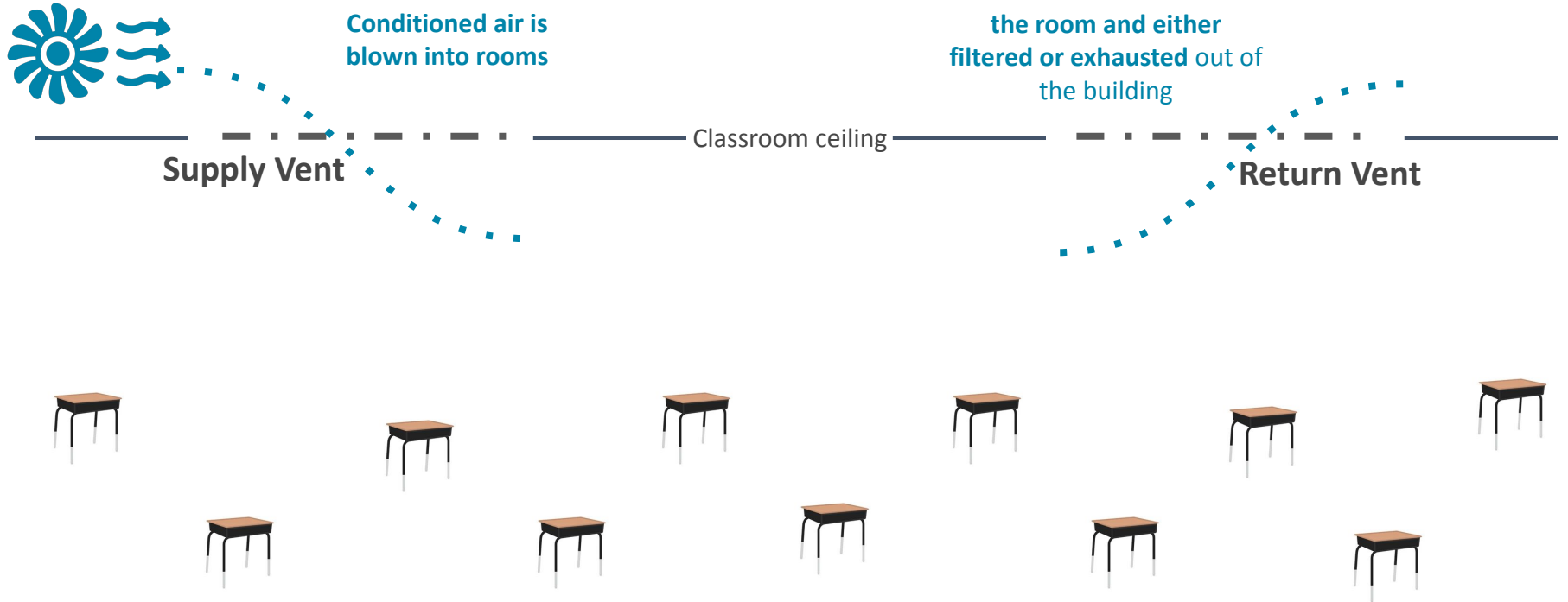
Air Handling Unit (AHU)



WORKING PROCESS OF DOUBLE SKIN AHU



Supply and Return Vents



**What has Facilities done to meet
CDC, DOH, and L&I
recommendations?**

Air Exchange

Our HVAC systems meet or exceed CDC and DOH guidelines for schools.

- Our systems are programed to provide at least 4-6 air exchanges per hour (meeting CDC and DOH recommendations.)
 - In most cases, we get 8-12 exchanges per hour.
- We individually adjusted controls on ALL air handling equipment to increase air exchange.
- We extended the runtime by two hours before and two hours after classes, purging buildings of stagnant air.
- We are operating all supply fans at an increased rate, introducing 5% more outside air and operating any auxiliary exhaust fans full time (i.e. bathrooms).



Measuring Air Intake

After completing mechanical adjustments to permit additional outside airflow, the cubic feet per minute (CFM) of airflow was measured.



CFM audit compared actual airflow with CDC and DOH recommendations. In most cases, we exceeded the recommended airflow.

Audit reports are posted in the Hybrid Guidebook in Canvas.

Windows

In newer buildings with updated HVAC systems and Air Handling Units:

- Opening doors and windows disrupts air pressure, decreasing the system's ability to function at optimum levels and making the filtration system less effective.
- Leaving doors and windows closed allows the system to work at its optimum levels.

In buildings WITHOUT an Air Handling Unit:

- We have installed a portable air filtration machine, designed to filter an area up to 2,500 square feet. The average classroom is 980 square feet.
- Opening windows and doors can increase air flow.
- Operating a portable air filtration machine provides enough air to meet CDC and DOH recommendations. Windows will increase airflow above those recommendations.
- Fans can be used to increase the effectiveness of open windows.

Doors

In buildings WITHOUT an Air Handling Unit:

- Doors may be propped open, as long as they are not an interior door leading to a hallway (per Fire Code)
- Exterior doors may be opened to allow for additional fresh air circulation.



Number of Occupants

The number of occupants in a space is also a factor in determining air quality.

CDC and DOH recommendations are based on a standard 980-square-foot (sf) classroom with an average of 25 – 30 students.

With about half the normal number of students in each room for hybrid learning, the amount of available fresh air effectively doubled.

- 20 CFM of fresh air per student in a 980 sf classroom occupied by 30 students
- 40 CFM of fresh air per student in a 980 sf classroom occupied by 15 students

Summer Cleaning & Spring Filter Change

In addition to the mechanical measures, last summer our custodial department thoroughly cleaned and disinfected all schools and addressed air quality concerns.

- Schools were deep cleaned and disinfected
- All HVAC filters were changed
- All carpets cleaned and tile floors waxed
- Indoor windows cleaned
- Dusted all areas, including all high areas

During spring break, all custodians will change HVAC filters.

In Summary

- We have taken measures to ensure that **indoor air quality in our schools meets and in most cases exceeds** CDC, DOH and L&I recommended guidance for school HVAC systems.
- CDC, DOH, and L&I recommendations are **based on ASHRAE** (American Society of Heating Refrigeration Air Conditioning Engineering) standard 62-1
- All HVAC and Air Handling Unit filters **will be changed over spring break.**
- We will continue our commitment to **ongoing cleaning, mechanical adjustments and increased frequency of filter changes** in our schools.
- **Ventilation and filtration are not effective alone** – they must be used along with other measures (e.g., physical distancing, distancing and occupancy limits, frequent hand washing, PPE, etc.)

**Please share any additional questions via
the Q&A function on your screen**

These questions will be collected so we can respond on our
website with the recording of this webinar

Thank You!



>>highlineschools.org/ReturnToLearn>>

