MISSOURI SCHOOL BOARDS' ASSOCIATION

HELPING SCHOOL BOARDS ENSURE ALL STUDENTS SUCCEED

Indoor Air Quality

Presenters / Collaborators

Dr. Elizabeth Friedman, MD, MPH

Pediatrician, Children's Mercy Hospital

Luke Gard, CIEC, CMC, BOC

Healthy School Program Manager, Children's Mercy Hospital

Kyle Gorrell, Director of Facilities, Lee's Summit School District

Missouri School Plant Managers Association

Carl Holden, PE, LEED AP

Principal, Mechanical Engineer, Henderson Engineers

Why?

- Awareness
  - Importance - Current events
  - Topics related to IAQ - Overload
  - Consistent Message
- Education
  - IAQ is more than viruses
  - Important topics - Contaminant Sources
- Evaluation
  - Help identify existing needs

Contaminant sources

Exhaled air

Allergens from outdoors

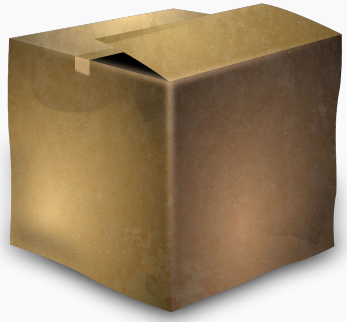
Allergens (reservoirs)

Storage (cardboard/paper

Animals (Pests and Pets)

Chemicals (Approved and brought from home)

Human behaviors)



HVAC

Handle Cooling Load - move heat

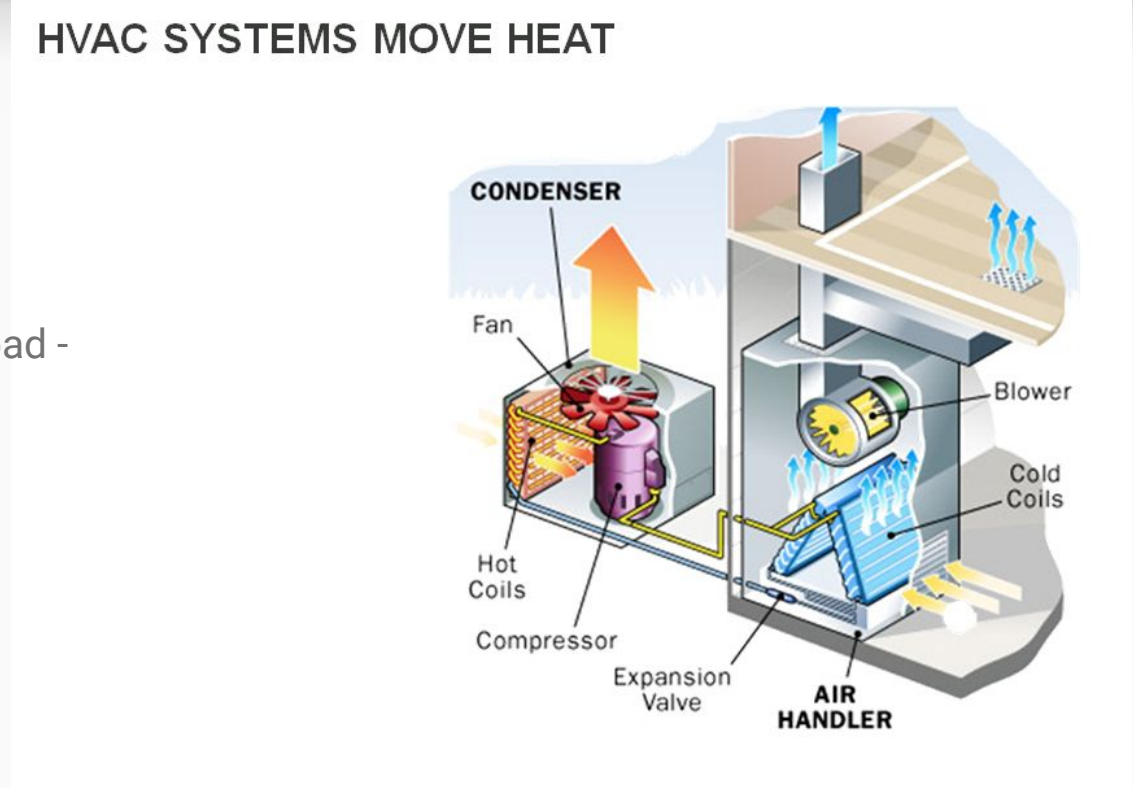
Handle Moisture in the building

Ventilation Heating and Cooling Load -

42% energy use for cooling

83% energy use for heating

Filtration of Air



Ventilation

Introduce Fresh/Outdoor Air to the classroom

-Some systems may not be setup for outdoor air

-Others do, but aren't being used (OA damper settings)
-Some may be fan cycling

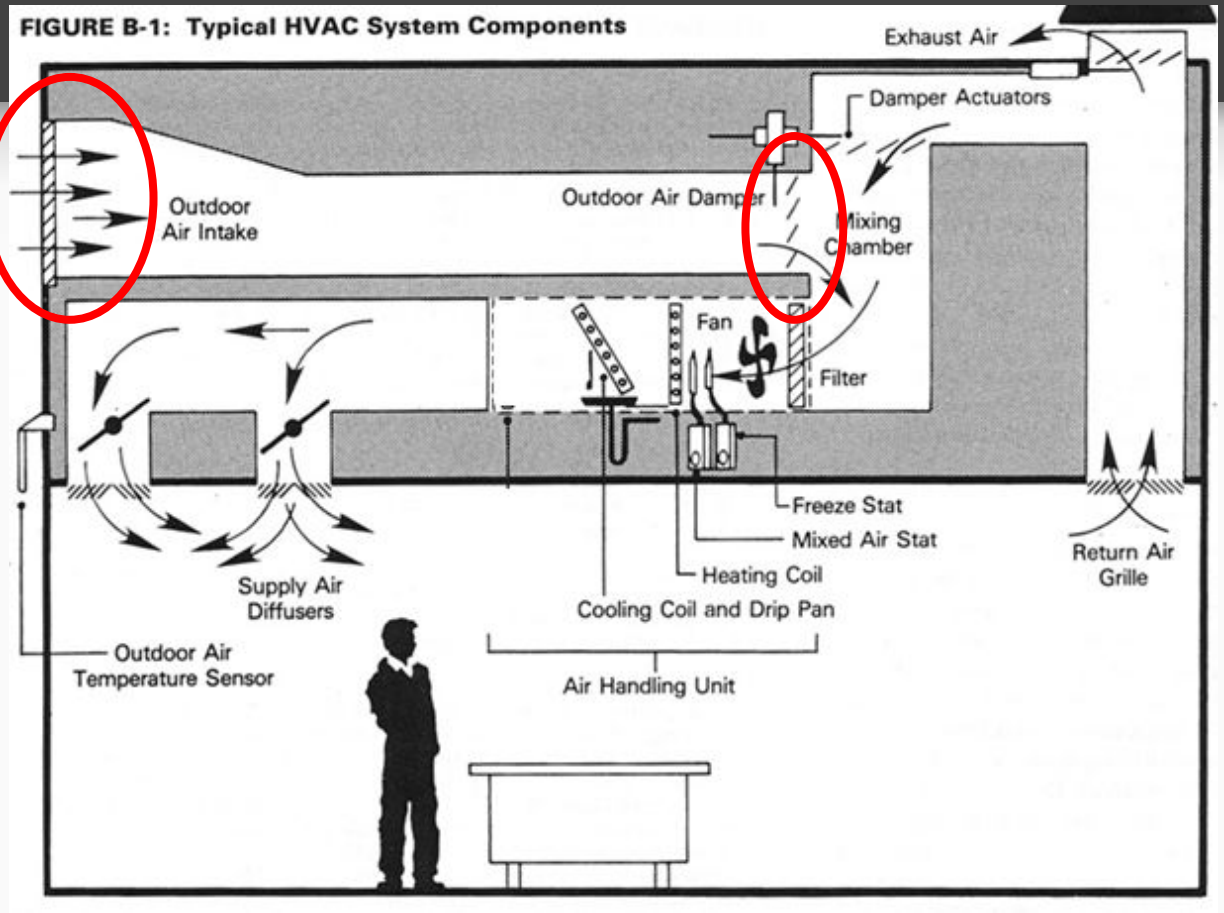
Air exchange rate is essential to IAQ

Codes include:

ASHRAE 62.1

IMC CH4 (ventilation) and CH5 (exhaust)

State and City Standards and Modifications



HVAC Supplemental Systems

Most common systems on the market

Bipolar Ionization

UV Light

Dry Hydrogen Peroxide (DHP)

Portable Air Cleaners

UL 2998 standard certification - Zero Ozone Emissions

Evaluate safety standards, life cycle cost and maintenance implications

Filtration

ASHRAE 52.2 - Filter Ratings

MINIMUM **E**FFICIENCY
REPORTING **V**ALUE - MERV

Single number used to represent efficiency across a range of particle sizes

Rating scale from 1-16+ from lowest to highest average efficiency

MERV Rating Chart

MERV Rating:	0.3-1.0 µm	1.0-3.0 µm	3.0-10.0 µm
MERV 1	Under 20%	Under 20%	Under 20%
MERV 2	Under 20%	Under 20%	Under 20%
MERV 3	Under 20%	Under 20%	Under 20%
MERV 4	Under 20%	Under 20%	Under 20%
MERV 5	Under 20%	Under 20%	20% - 34%
MERV 6	Under 20%	Under 20%	35% - 49%
MERV 7	Under 20%	Under 20%	50% - 69%
MERV 8	Under 20%	Under 20%	70% - 85%
MERV 9	Under 20%	Under 50%	Above 85%
MERV 10	Under 20%	50% - 64%	Above 85%
MERV 11	Under 20%	65% - 79%	Above 85%
MERV 12	Under 20%	80% - 90%	Above 90%
MERV 13	Under 75%	Above 90%	Above 90%
MERV 14	75% - 84%	Above 90%	Above 90%
MERV 15	85% - 94%	Above 95%	Above 90%
MERV 16	Above 95%	Above 95%	Above 90%
MERV 17	99.97%	Above 99%	Above 99%
MERV 18	99.997%	Above 99%	Above 99%
MERV 19	99.9997%	Above 99%	Above 99%
MERV 20	99.99997%	Above 99%	Above 99%

Moisture Management

Primary Sources of Moisture

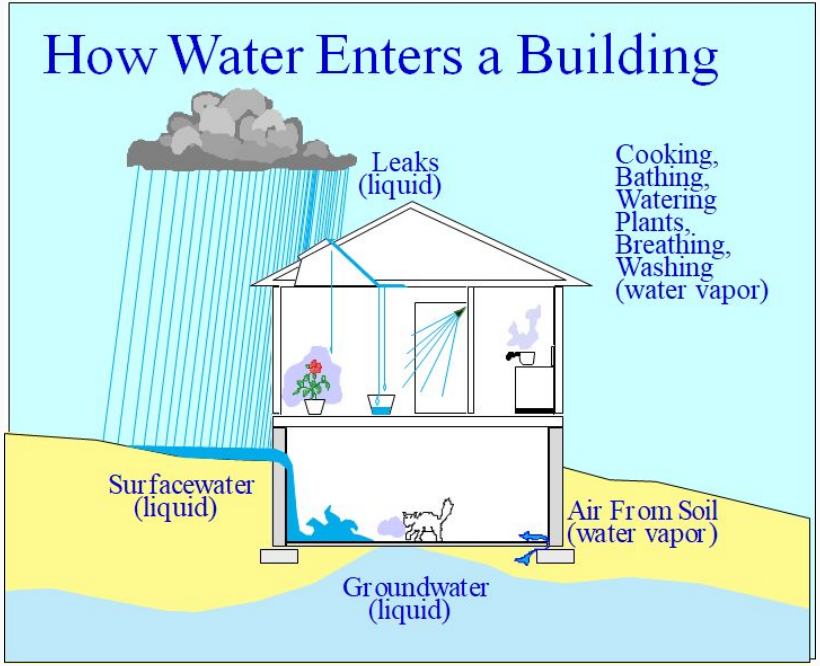
Environmental (rain)

People

Condensation

Plumbing

Construction (new materials)



Cleaning

Cleaning/Disinfecting for SARS-CoV-2 Virus

- EPA N-List of disinfectants and sanitizers approved for surfaces
- Safer, healthier ingredients: H2O2, ethyl alcohol, citric acid, L-lactic acid
- Quaternary ammonium products pose health risks (asthmagen)
- Product application: Wipes vs. Liquids vs. Sprays