

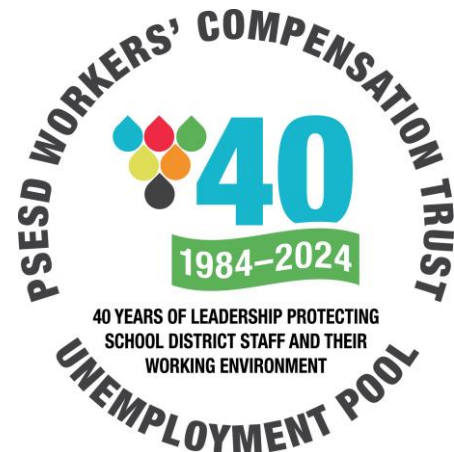


Washington State Department of

HEALTH

SCHOOL ENVIRONMENTAL HEALTH & SAFETY

AUTUMN WORKSHOP



November 7, 2023



Making Sense for the Senses

School Inspection Tools

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Tacoma-Pierce County
Health Department
Healthy People in Healthy Communities

What are our 5 senses?

- Sight.
- Hearing.
- Smell.
- Touch.
- Taste.



Why is this important?

- We want to protect our senses!
- We need to use our senses to learn.
- Students spend a large portion of their lives in school.
- Safer and healthier buildings contribute to better learning environments.
- We want to ensure students have a safe place to learn and thrive.



Light

- Measured in foot candles.
- What is a foot candle?
 - Measurement of light intensity.
 - Defined as enough light to saturate a 1 foot square with 1 lumen of light.
 - Measures the amount of light that reaches a surface rather than the amount of light leaving a light source.



Light

- Why is this important?
 - Students learn better!
 - Dim lighting can make it harder to read and perceive object differences.
 - Some studies have shown dim lighting reduces the brain's ability to collect information.
 - Lighting can be a safety issue in certain settings when fine motor skills are required.



Light

Area	Minimum foot candle intensity
General instructional areas (classrooms, study halls, lecture rooms, libraries)	30
Specialty instructional areas (science labs, prep rooms, chemical storage areas, shops, art, CTE)	50
Kitchen areas	30
Noninstructional areas (auditoriums, lunch rooms, hallways, stairs, bathrooms)	10
Gyms (showers, locker rooms)	20

WAC 246-366-120



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Light



Noise

- Measured in decibels (dB).
- Can be adjusted to human hearing (A-weighting).
- Other common weighting systems: C, Z and zero.
- Typical noise levels:
 - 20 dBA: Whisper, quiet room.
 - 40 dBA: Rain, computer fan.
 - 60 dBA: Busy street, alarm clock.
 - 90 dBA: Lawnmower, hair dryer, blender.
 - 140 dBA: Jet engine (pain threshold/serious hearing damage).



Noise

- Why is this important?
 - Background noise can have health effects (can cause stress, anxiety, depression).
 - Excessive noise can lead to hearing loss (which is irreversible!).
 - Can make it difficult to learn if you can't hear.



Noise

- Background noise at any student location in the classroom cannot exceed 45 dBA (Leqx) where x is 30 seconds or more.
- The maximum ambient noise level in industrial arts, vocational agriculture and trade, and industrial classrooms cannot exceed 65 dBA when all fume and dust exhaust systems are operating.
- No student can be exposed to sound levels equal to or greater than 115 dBA.
- Use Table 1 in WAC 246-366-110 for other maximum permissible noise exposures.

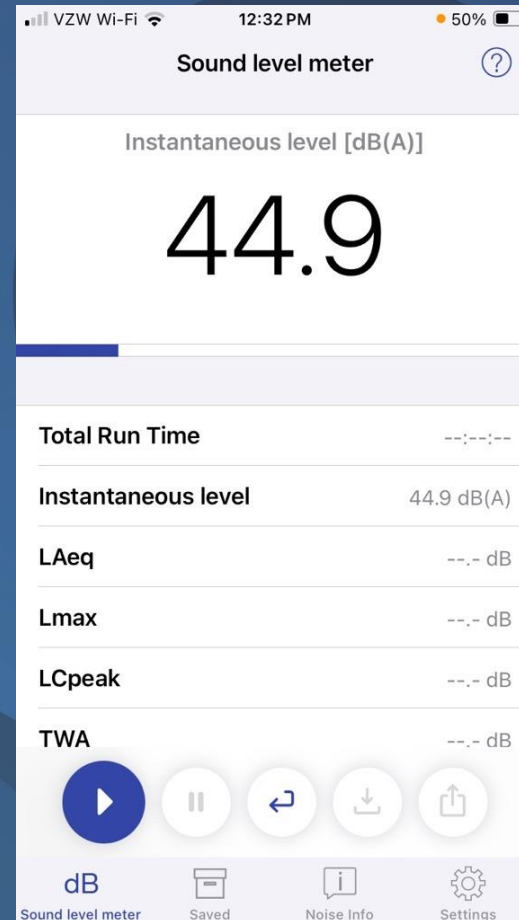
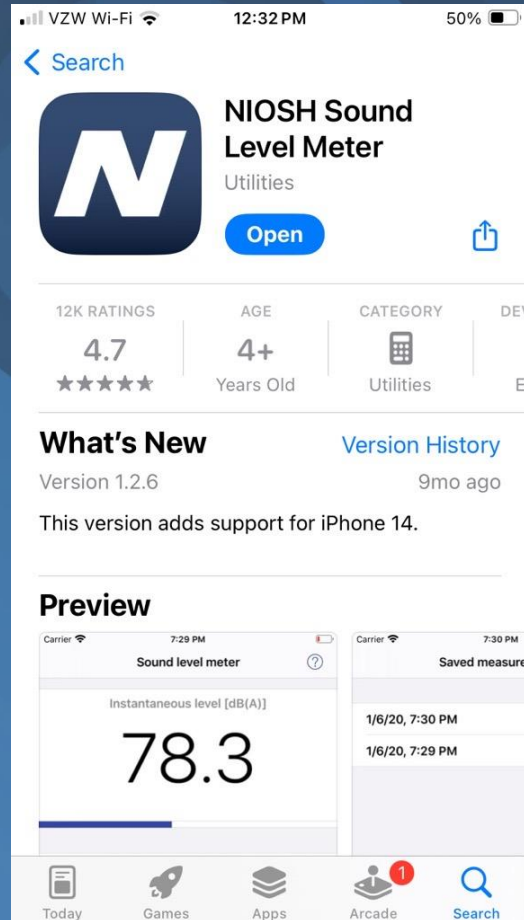


Noise

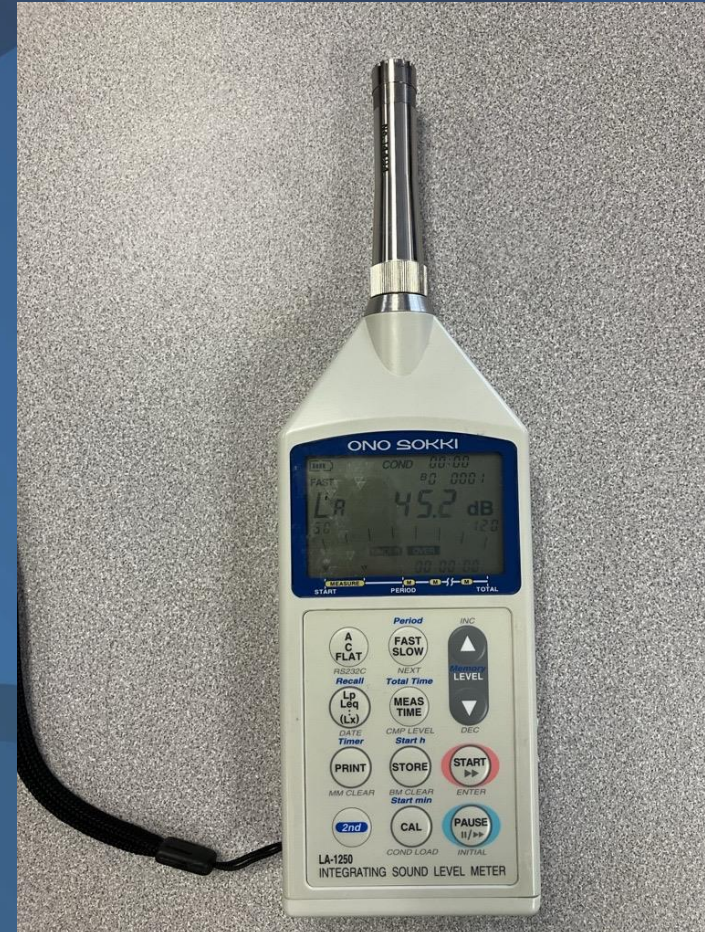
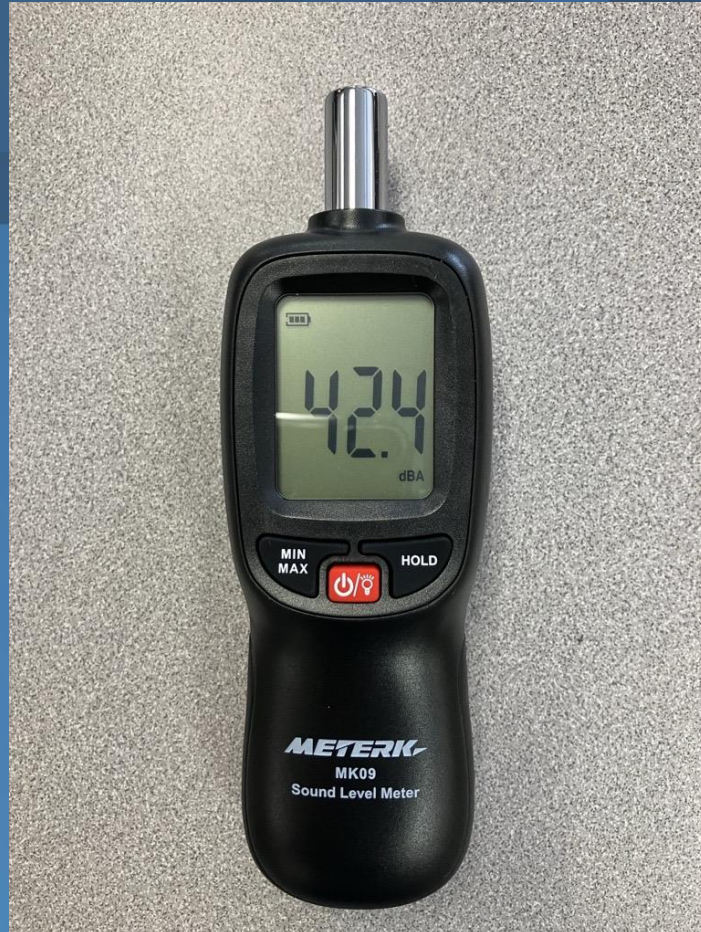
- Common sources in schools:
 - HVAC systems.
 - Fans.
 - Air purifiers.
- Uncommon sources (but ones that happen!):
 - Fish tanks.
 - Computer servers.
 - Other examples?



Noise



Noise



Ventilation

- Process of moving air into, out of or within a room.
- Buildings should have HVAC systems to recirculate some portion of the air and bring in fresh air.
- Can be measured using carbon dioxide levels (CO₂).
 - Higher levels of CO₂ can be an indicator of poor air quality.



Ventilation

- Why is this important?
 - Poor ventilation can lead to:
 - Asthma/allergic reactions/headaches.
 - Higher susceptibility to illness.
 - Increased absenteeism.
 - Reduced student learning/performance.
 - Remember – Children are also more likely than adults to be affected by poor air quality!

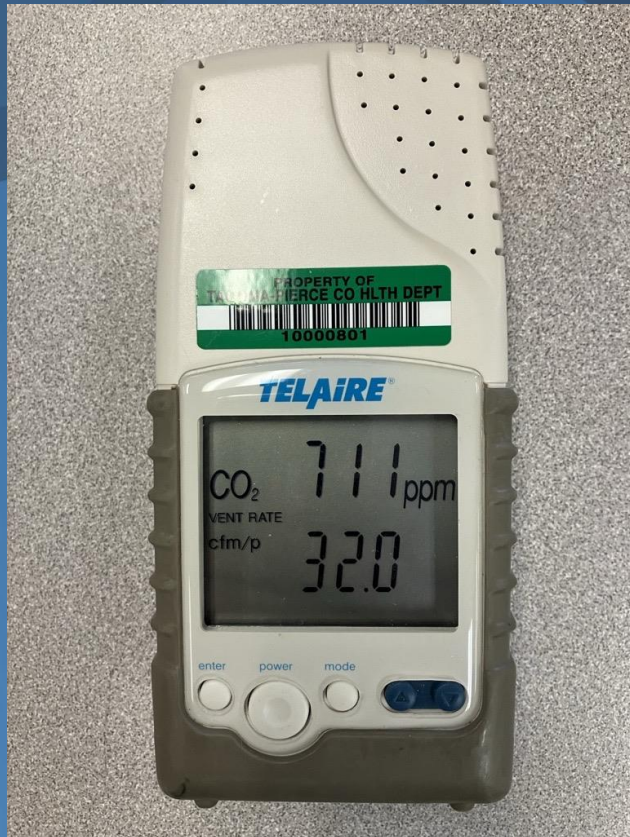


Ventilation

- WAC 246-366-080
 - (1) All rooms used by students or staff shall be kept reasonably free of all objectionable odor, excessive heat or condensation.
 - (2) All sources producing air contaminants of public health importance shall be controlled by the provision and maintenance of local mechanical exhaust ventilation systems as approved by the health officer.
- ASHRAE 62.1
 - General classrooms: 13-15 cfm/p.
 - Other spaces like science labs and shops require additional cfm/p.



Ventilation



Ventilation

- Other factors also impact ventilation.
 - Pressure relationships: Some spaces need negative air pressure.
 - Health rooms.
 - Bathrooms.
 - Custodial closets.
 - Science rooms.
 - Temperature
 - Summer: 74.5 – 81 °F.
 - Winter: 68 – 75.5 °F.
 - Minimum 65 °F in building and 60 °F in gyms.
 - Relative humidity
 - Range: 40 – 60%.

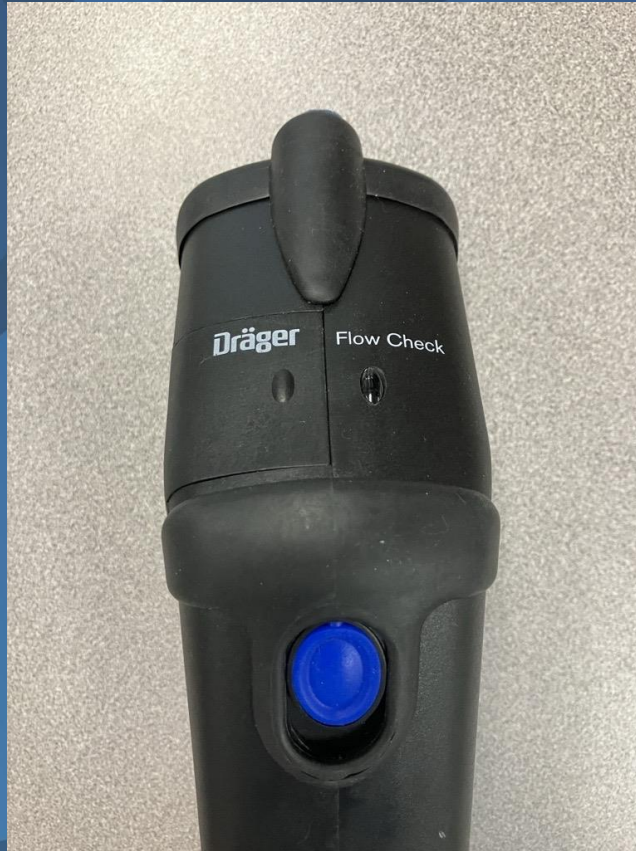


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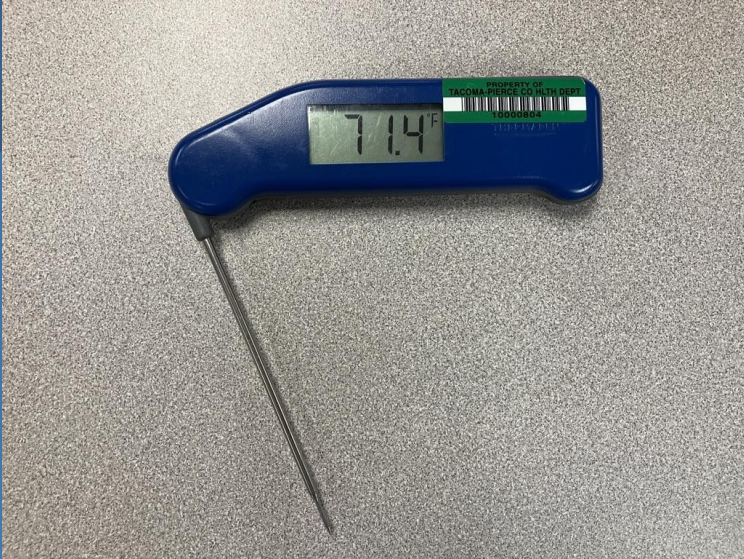
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Ventilation



Ventilation



What other gear do we use?

Main inspection

- Light meter.
- (Sound meter.)
- Flow check airflow indicator.
- CO₂/CFM/p (cubic feet per minute per person) monitor.
- Thermometers—digital food and infrared.
- Humidity tester.
- Outlet tester.
- Moisture meter.

Playground

- Head probe.
- Torso probe.
- Fish probe.
- Protrusion/entanglement gauges.
- Shovel.
- Tape measure.
- Gap gauge.
- (Handgrip template.)
- (Neoprene rods.)
- (Force gauge.)



Remember—We share a common goal!

Let's keep our students and staff safe and healthy!



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Questions?

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