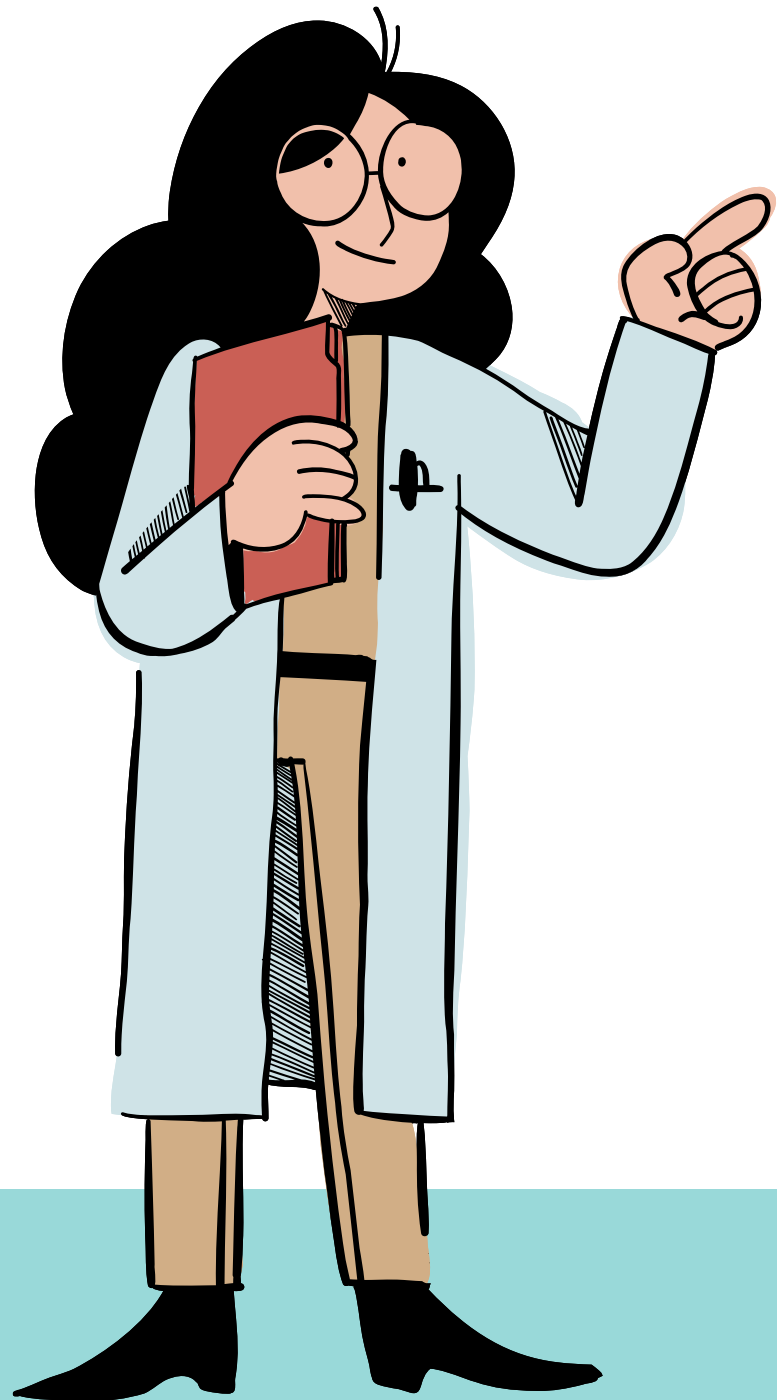


Indoor Air Quality Safe Practices



Purpose

This training module will explore healthy and safe practices for businesses (including home-based) related to indoor air quality. At the completion of the training, each participant should be able to...



Purpose

1. Identify different ventilation and filtration methods



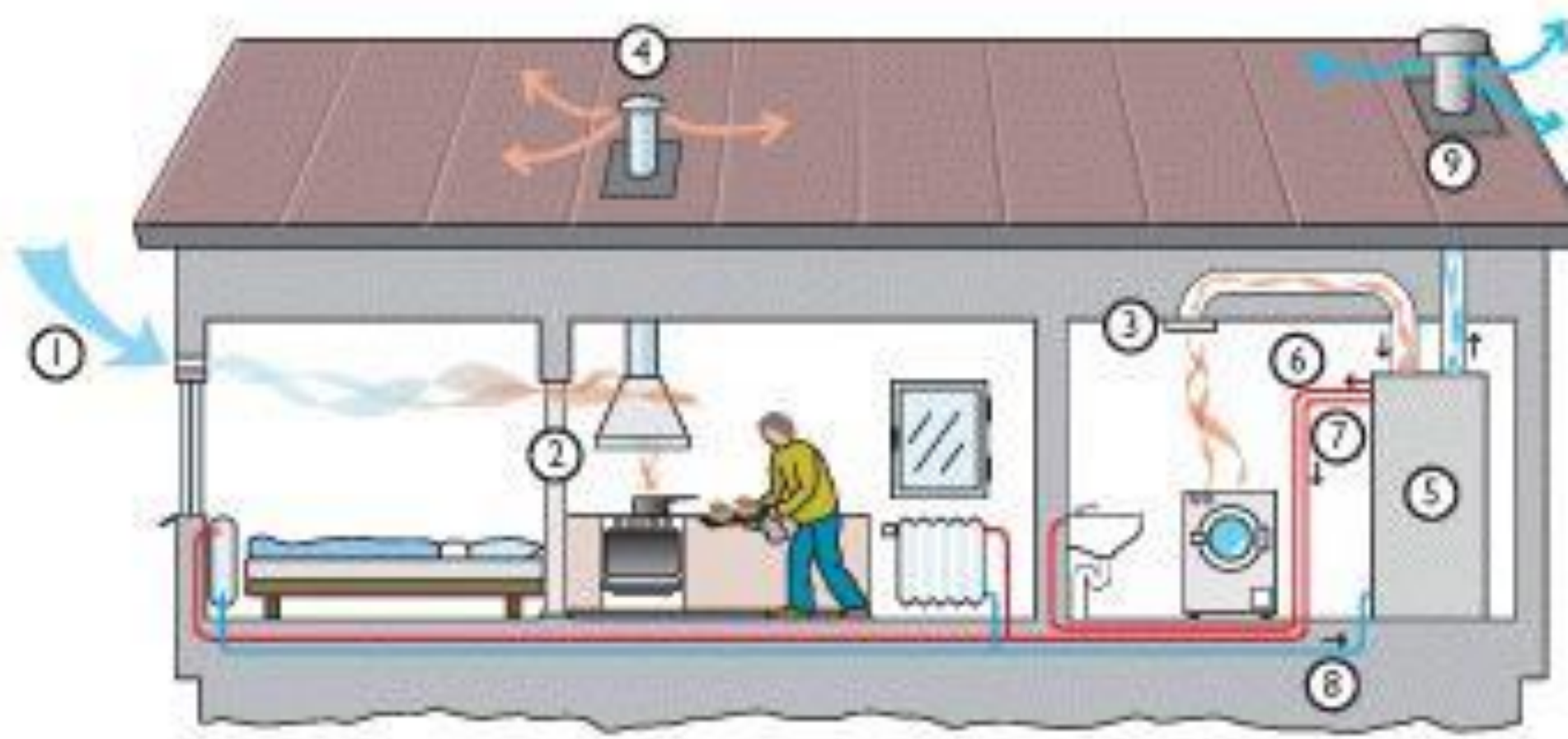
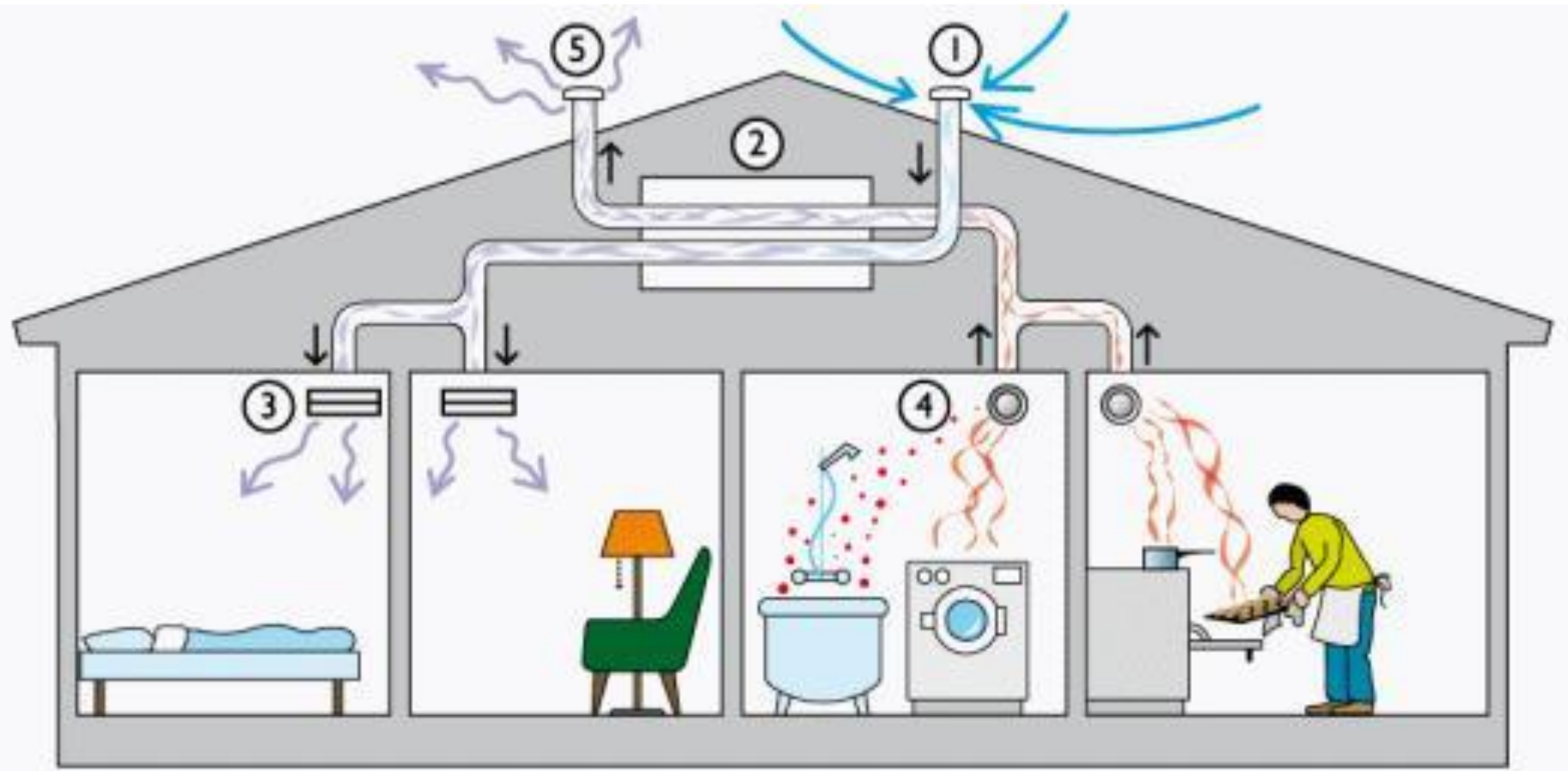
Purpose

2. List and describe specific actions to improve indoor air quality



Purpose

3. Determine at least one or multiple action(s) they can take at their facility



Why indoor air quality is important

"Indoor Air Quality" refers to the quality of the air in a home, school, office, or other building environment.



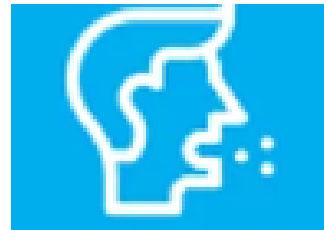
Why indoor air quality is important

On average, Americans spend about 90 percent of their time indoors, where the concentrations of some pollutants are often 2 to 5 times higher than typical outdoor concentrations.



Common types of indoor air pollutants

Airborne Particles



- ❑ Dust, dead skin, pollen, vehicle exhaust, pet dander, dust mite feces, smoke, hair, plant matter

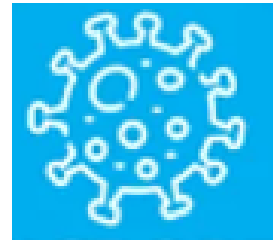
House Odors & Gases



- ❑ Cooking odors, pet smells, cigarettes, skin or drain smells, trash odors, “stale” air

Common types of indoor air pollutants

Microbes & Germs



- ❑ Bacteria, Mold, Yeasts, mites, viruses, fungus, toxins

Volatile Organic Compounds (VOCs)



- ❑ Paints, glues & varnishes, adhesives, furniture & office equipment, cleaning supplies, wood preservatives, carpet emissions, chemicals

Airborne Particles

Vehicle Exhaust



Dust



Wildfire smoke



Vehicle exhaust emissions | What comes out of a car exhaust? | RAC

Drive

Where Does Dust Come From? Guide to Sources in House and Solutions -

Molekule Blog

(Noah Berger / Associated Press)

House odors & Gasses

Trash Odors



©Freepik /

frimufilms

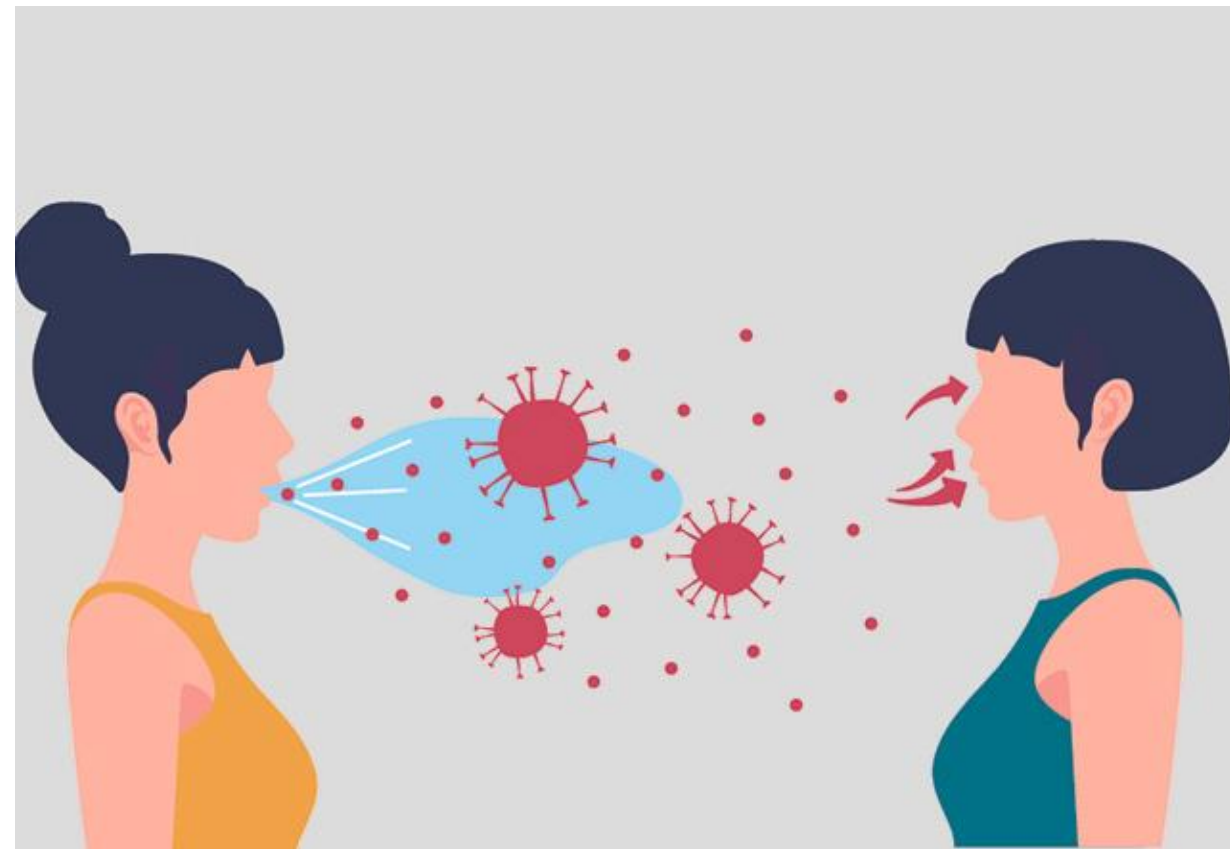
Sink or Drain Odors



NickyLloyd/iStock via Getty images / NickyLloyd/iStock via Getty images

Microbes & Germs

Viruses (Flu, COVID, etc)



covid19-family-safety-coronavirus.ashx (640x440)

(hopkinsmedicine.org)

Mold



Mold | Vermont Department of Health (healthvermont.gov)

Volatile Organic Compounds (VOCs)

Cleaning Supplies



What are VOCs? - Volatile Organic Compounds | Energy Air, Inc.

Paints , and Nail Polish



Getty

Household activities to improve indoor air quality

- Do not use scented products to cover up odors in the home (air fresheners do not clean the air, they instead add chemicals that can contribute to poor air quality)
- Damp dust and mop frequently
- Use a vacuum with a HEPA filter
- Avoid burning candles or incense indoors

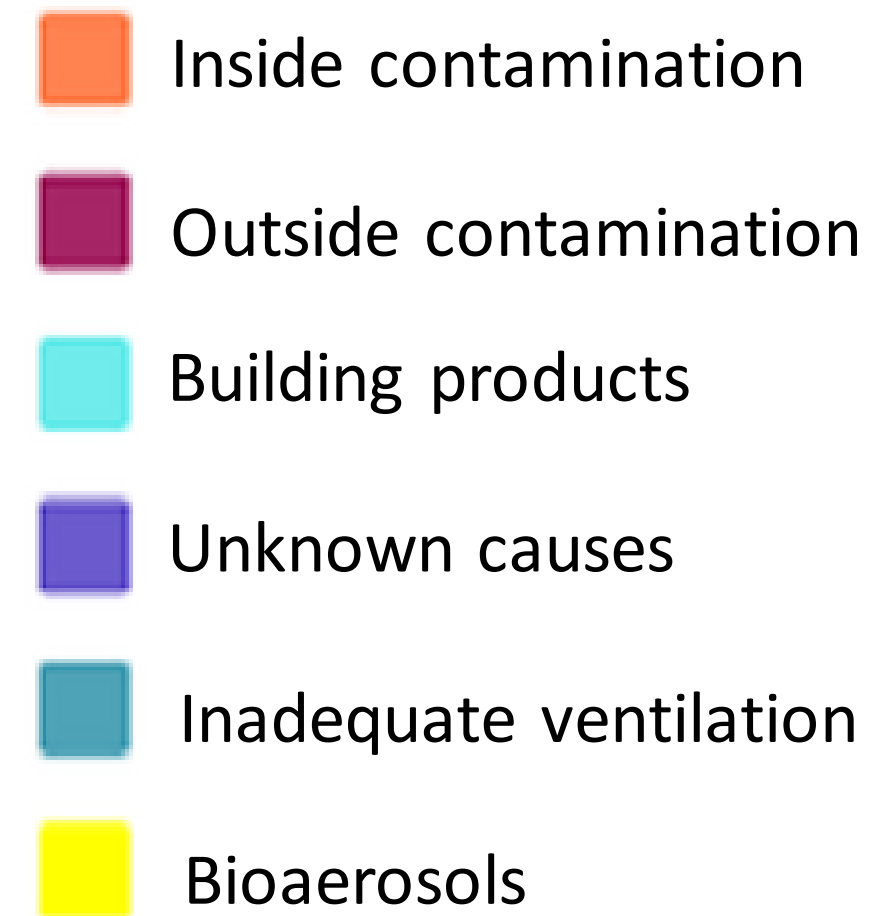
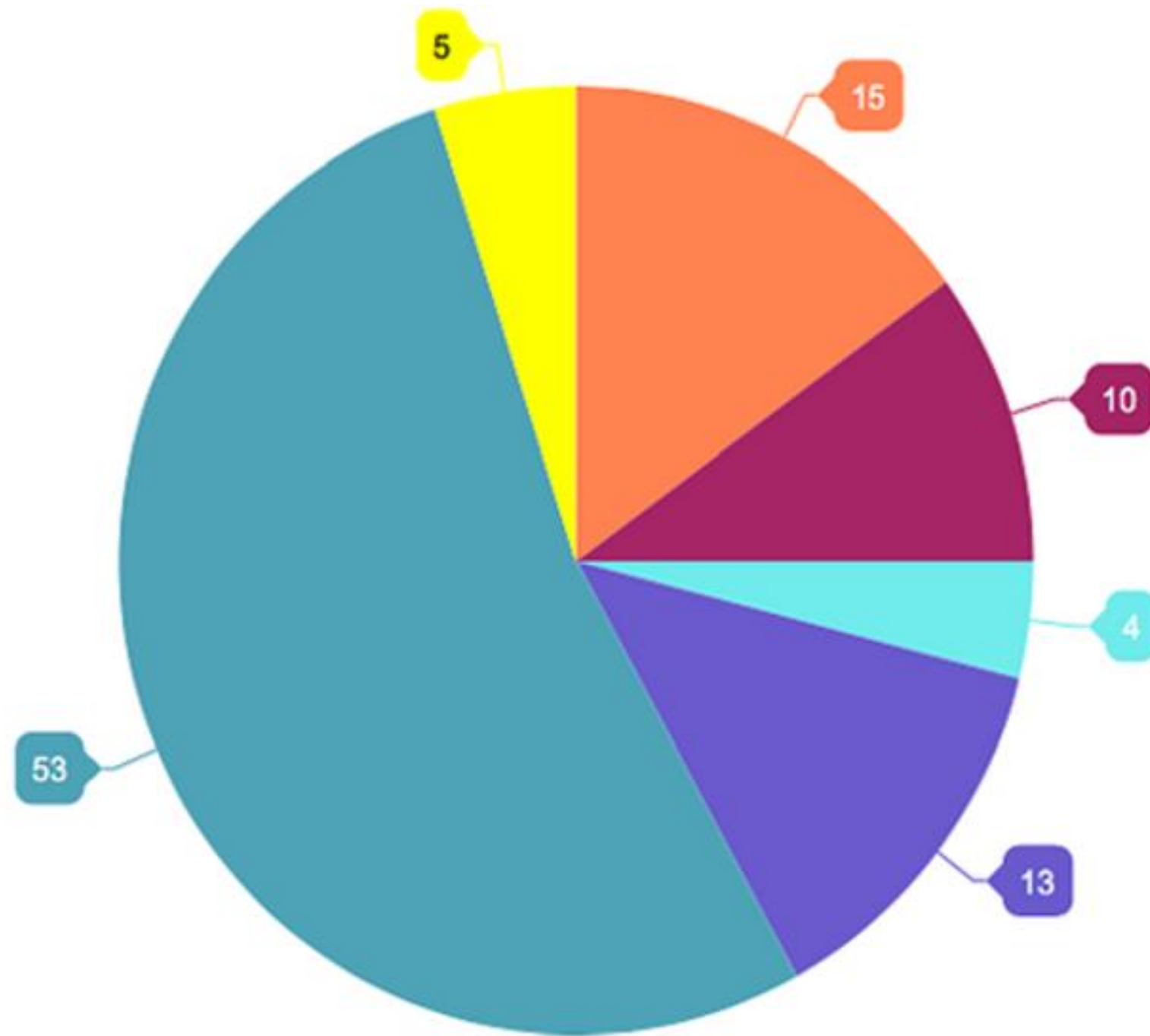


Household activities to improve indoor air quality

- Do not smoke indoors
- Don't wear shoes inside
- On polluted days, avoid using gas cooktops
 - Choose electric or induction cooktops when you are able too
- Avoid broiling or frying foods



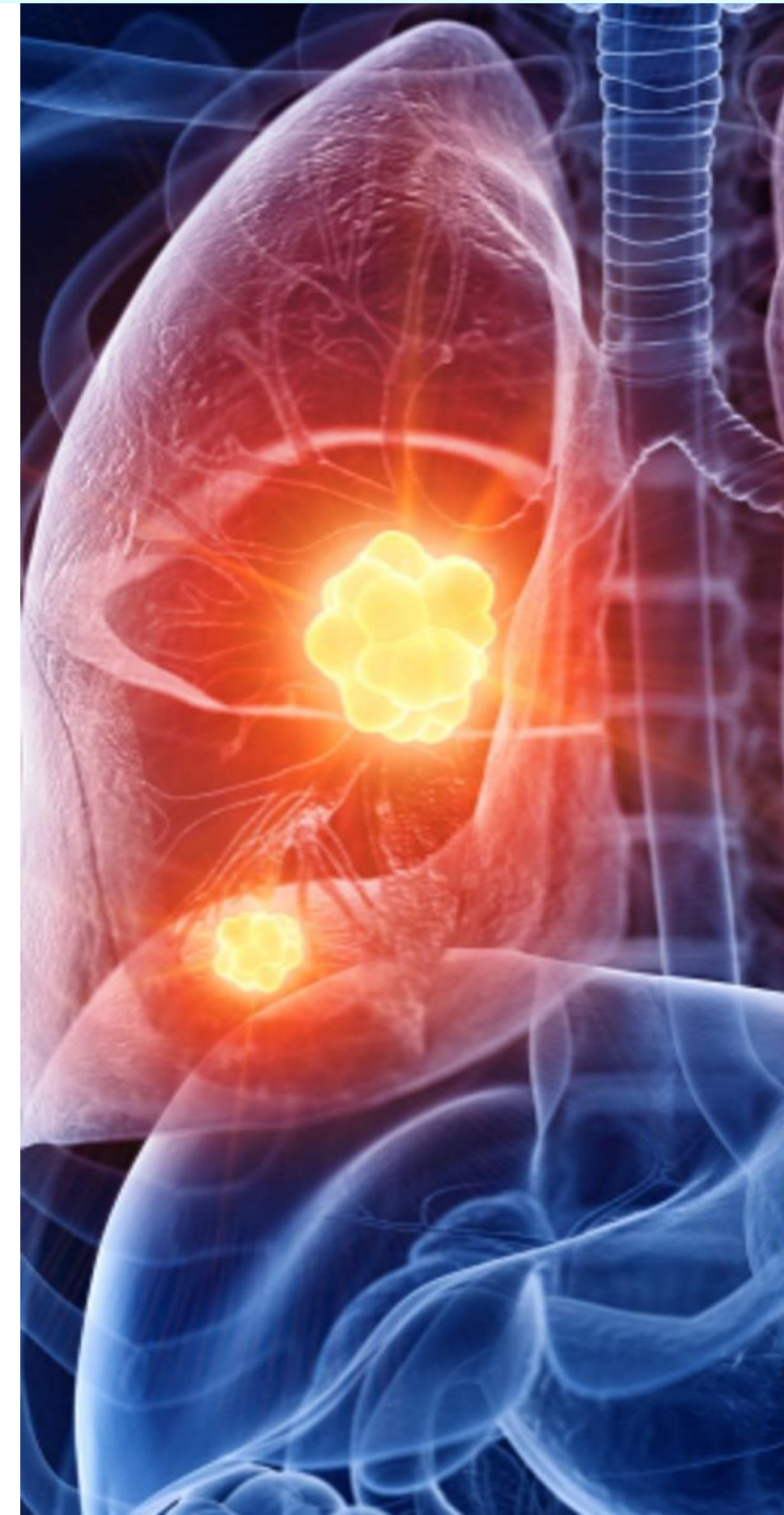
Cause of Poor Indoor Air Quality



The Effects of Poor Indoor Air Quality

Human health effects associated with poor indoor air quality include:

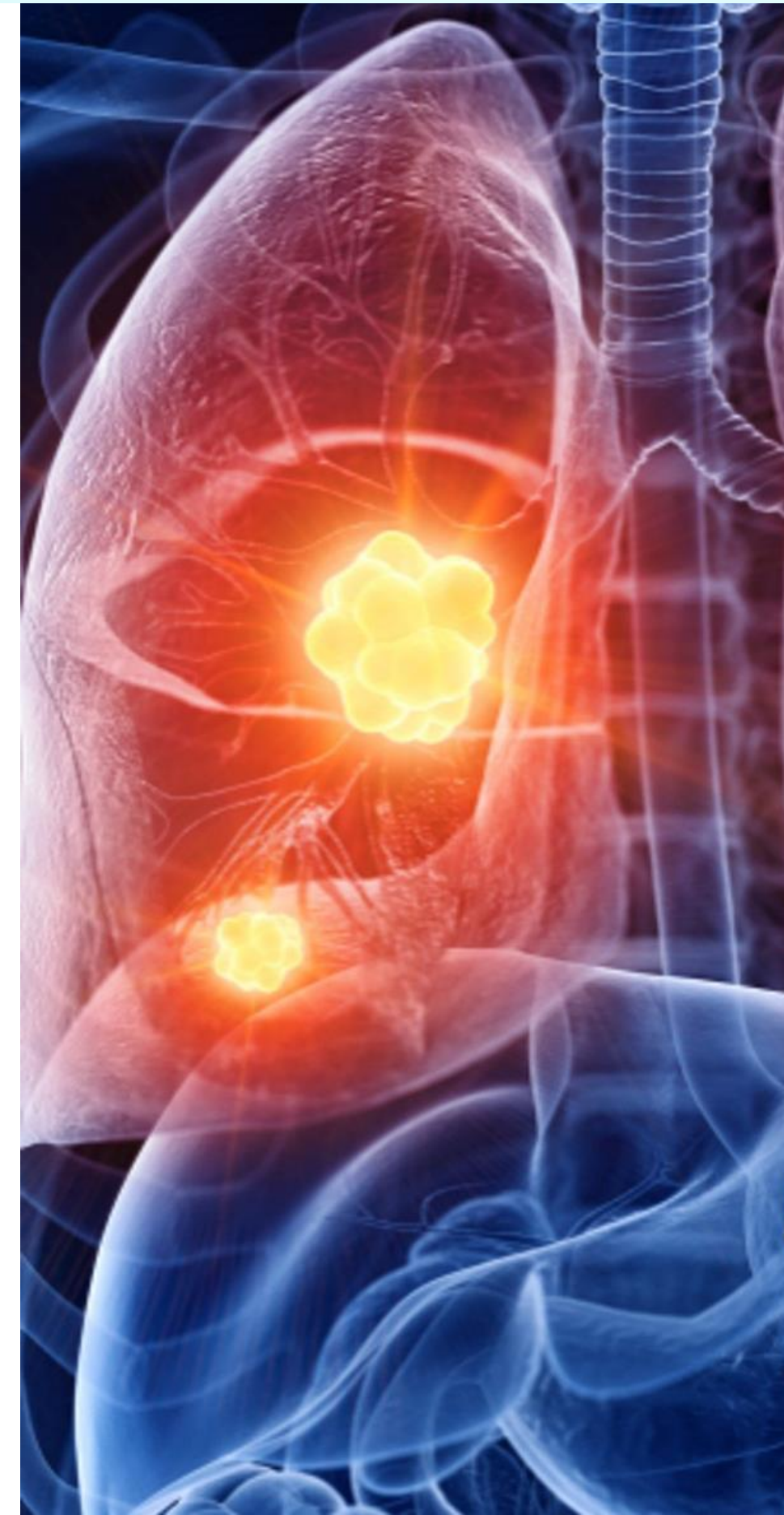
- Respiratory diseases (like asthma, and Chronic obstructive pulmonary disease)
- Heart disease, and cancer
- Headaches, dizziness, and fatigue



The Effects of Poor Indoor Air Quality

Human health effects associated with poor indoor air quality include:

- Irritation of the eyes, nose, and throat
- Cold or flu-like symptoms
- Make existing medical condition worse



The Effects of Poor Indoor Air Quality

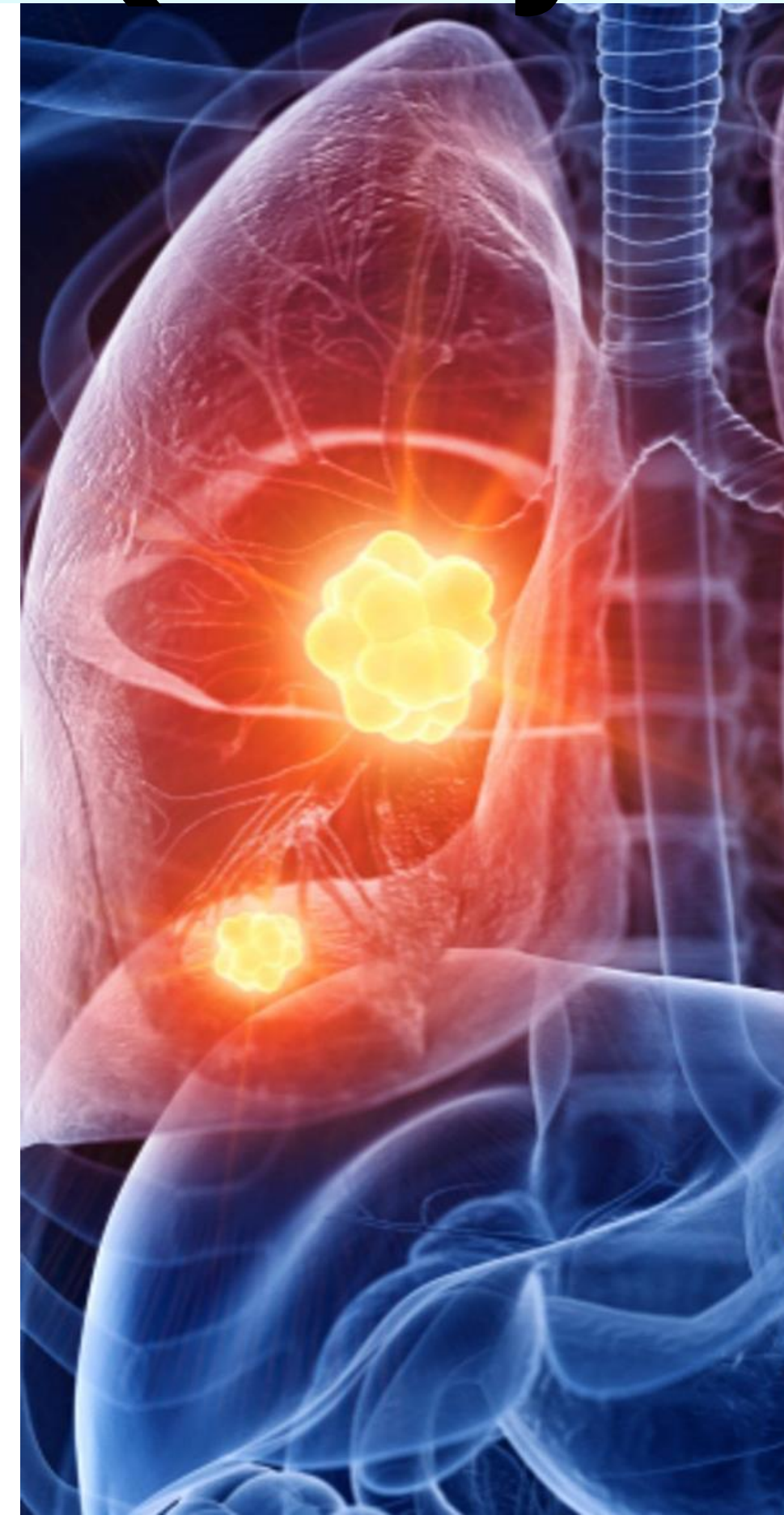
Over the past decade, researchers have found that high levels of air pollution may damage children's cognitive abilities, increase adults' risk of cognitive decline and possibly even contribute to depression.

American Psychological Association, 2012



Image Credit:

melitas/Shutterstock.com



The most sensitive groups

The most sensitive group of people to poor indoor

air quality include:

- Young children
- Pregnant people
- People with respiratory diseases, heart disease or chronic diseases
- People over the age 65+
- People who have (or had) COVID-19
- People experiencing the effects of environmental inequity (airport, industrial areas)

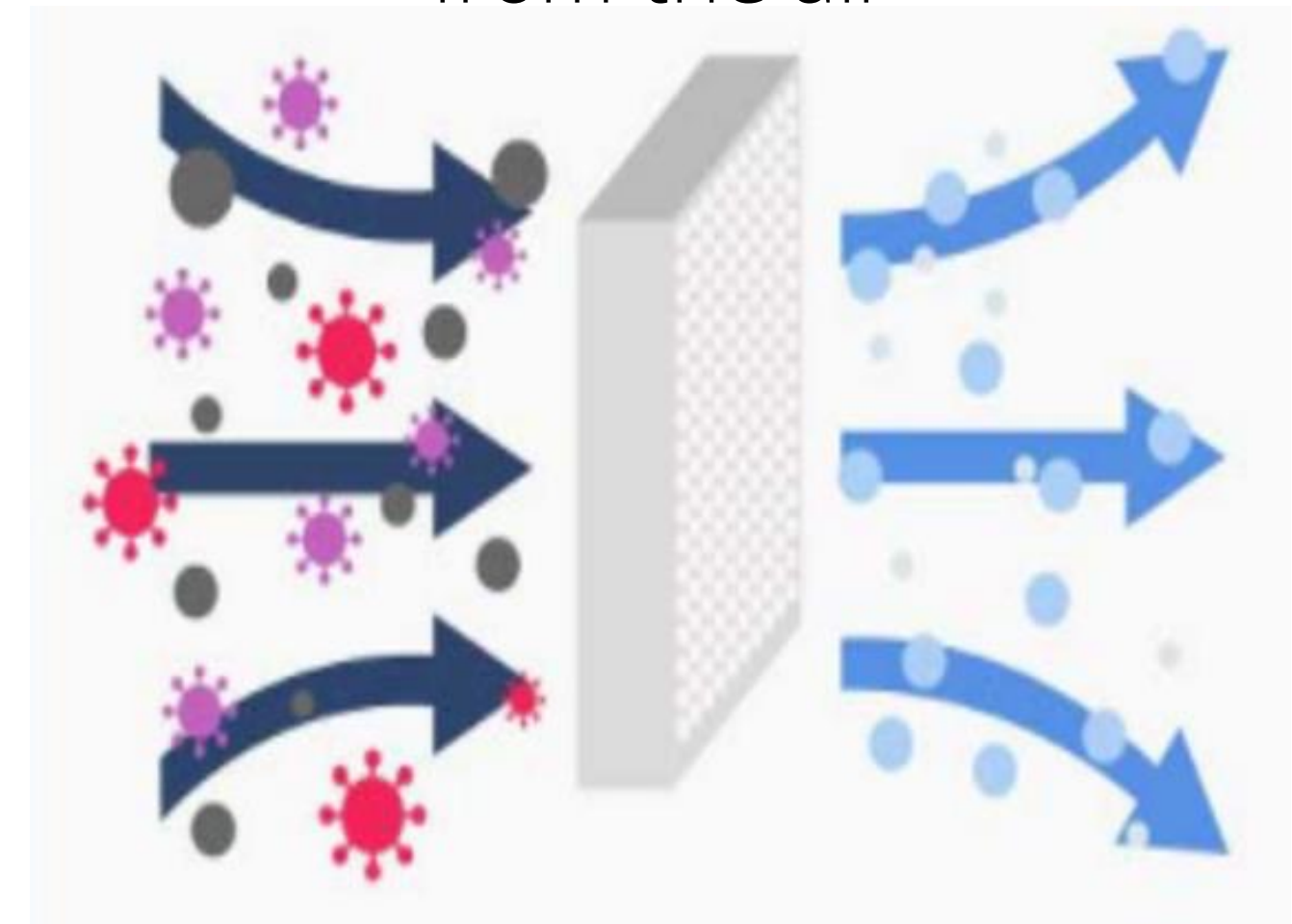


Ventilation and Filtration

Ventilation: bringing in fresh air (dilute)



Filtration: Capturing and removing particles from the air



Different types of Ventilation

Natural Sources of

Ventilation:

Windows and Doors



hinged-french-door-black-open.jpeg (540x300) (contentstack.io)

Mechanical Sources of

Ventilation:

HVAC (Heating, ventilation, and air conditioning), Fans, and exhaust systems



How a New HVAC System Can Keep Your Home Healthy | Anchor | GA (anchorac.com)

Natural Sources of Ventilation

- If weather and air quality permits, bring in as much fresh air as possible by opening doors and windows.
- Fans in a window to blow potentially contaminated air out and passively pull in new air through other open windows and doors.



Mechanical Sources of Ventilation

- The HVAC (Heating, Ventilation, and Air Conditioning) system is comprised of one or more air handling units that pull air in from the outside and circulate the air through the building.
- Local exhaust, such as bathroom fans or kitchen hoods, should be running whenever the building is occupied. This pulls air out of the building which brings new air in



Getty Images



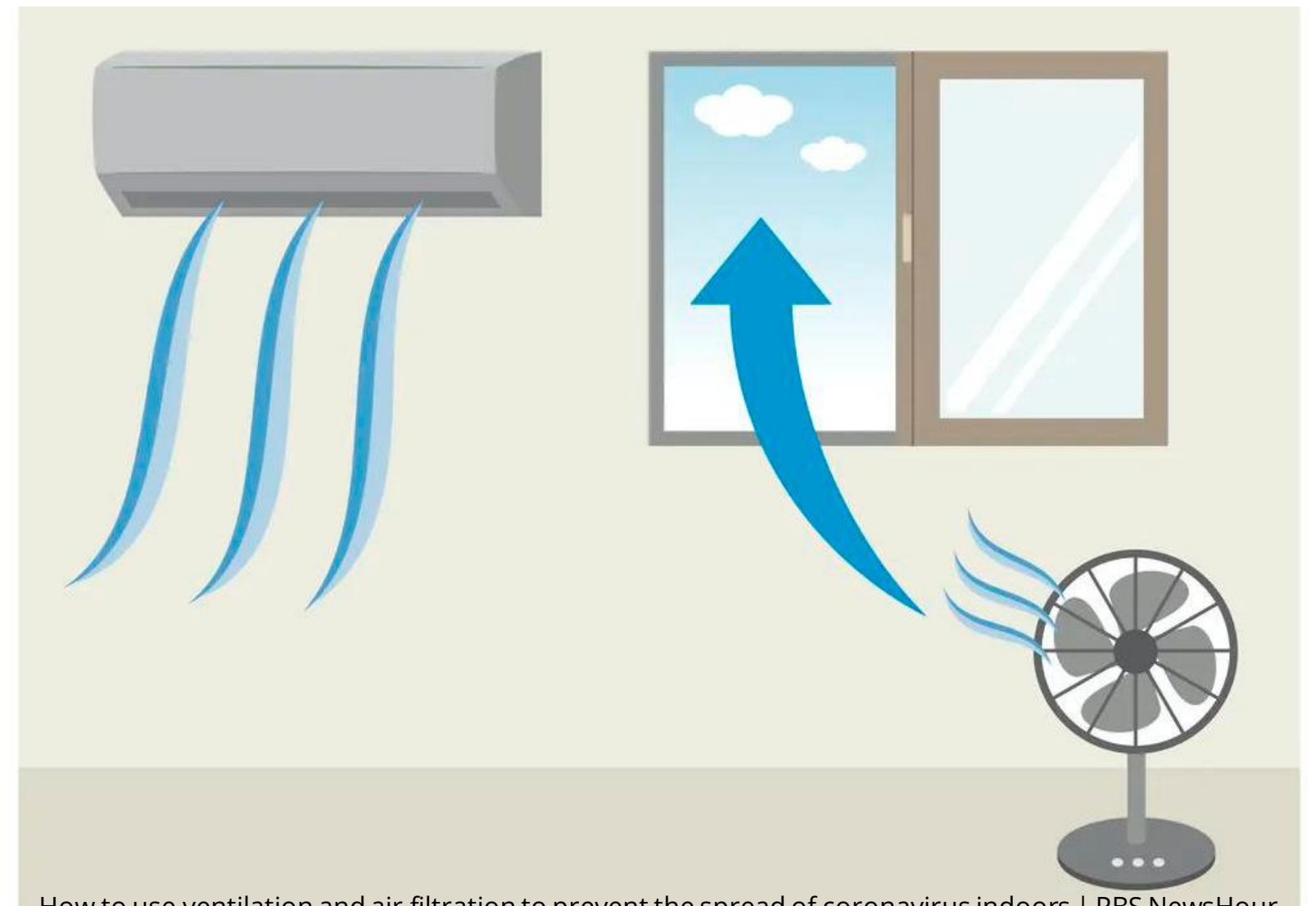
Range-Hood-for-Kitchen-220V-Kitchen-Hood-Chinese-Small-Kitchen-Extractor-Hood-Oil-Suction-Machine-Top.jpg_Q90.jpg_webp (750x1000)

Tips on using portable fans to improve airflow

Place a **fan as close as possible to** an open window blowing outside. This helps reduce indoor air pollutants, include virus particles. Even without an open window, fans can improve air flow.



Can't sleep because of the heat? Try this clever fan trick | Stuff.co.nz



How to use ventilation and air filtration to prevent the spread of coronavirus indoors | PBS NewsHour

Tips on using portable fans to improve airflow

If you need a fan to improve air flow or during hot weather, avoid blowing air from one person to another to prevent the spread of germs. Point fans away from people.



Where is your air coming from?

Supply Air Grill (Supply Diffuser) -
Supplying air inside the building



Return Air Grill (Return Diffuser)-
Removing air out of the building



How to start?

Locate your return air grill?



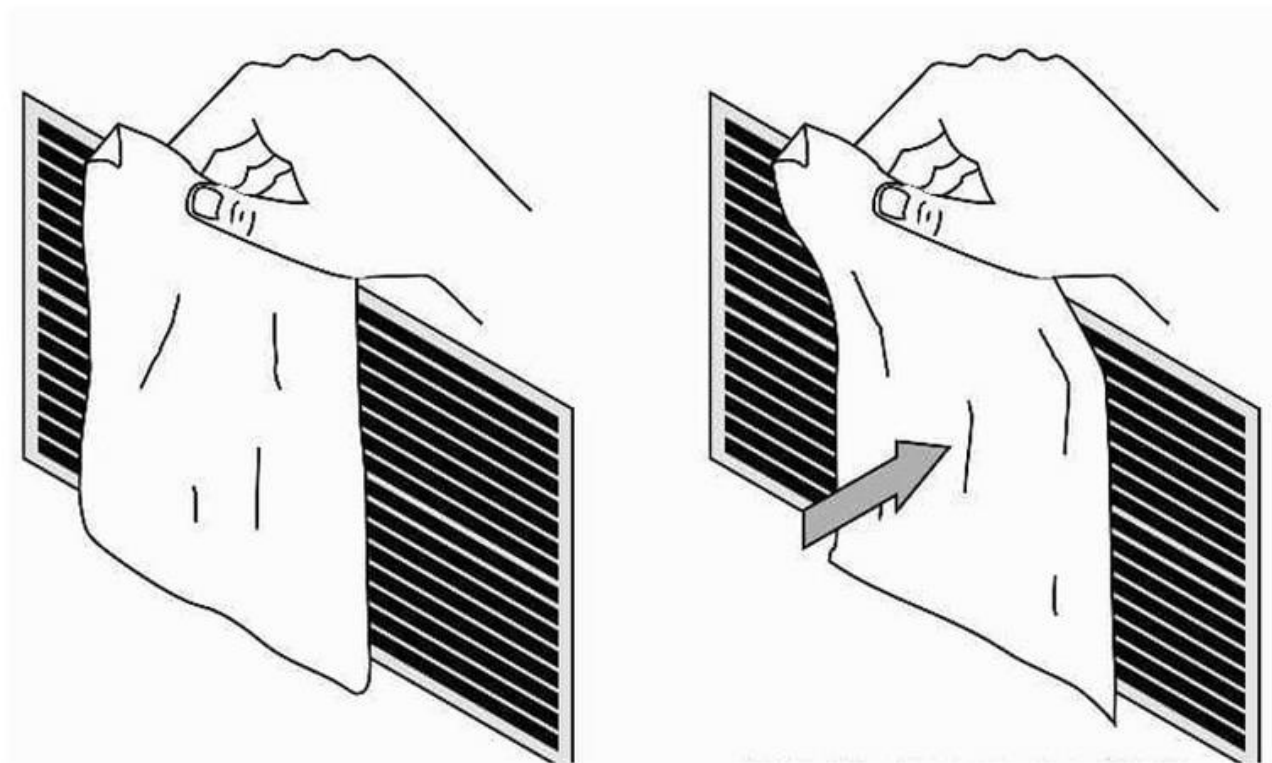
Are supply diffusers blocked?



Are return grilles blocked/dirty?

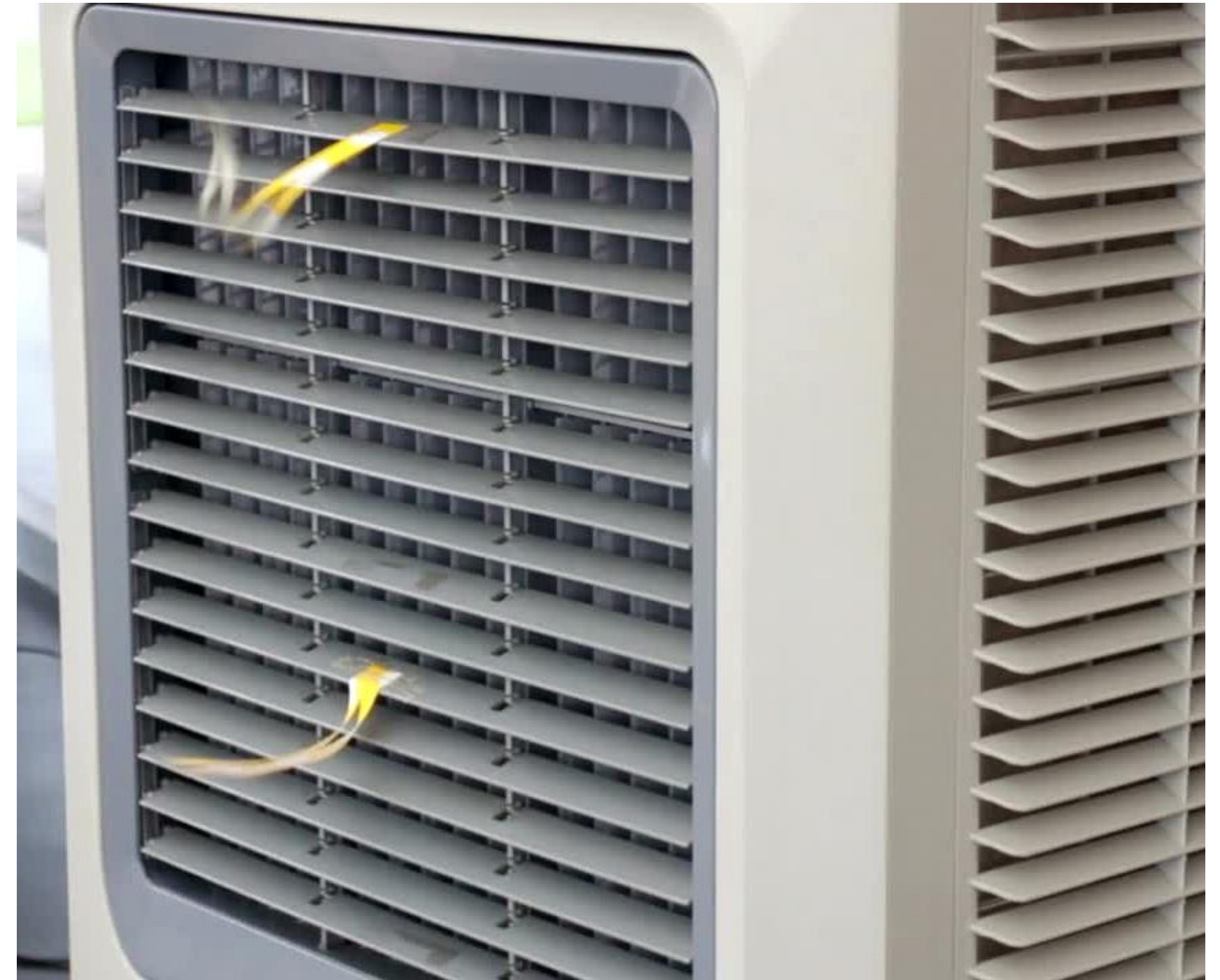


Tissue Test



Tissue is being pulled in (Return air grill)

Tissue is being blown (Supply air grill)



Solutions

If an HVAC is available, upgrade the filters to the highest rating the system can safely handle. We recommend MERV 13 or an equivalent rating. We also recommend bringing in as much outdoor air as your system can handle, aiming for 100%



Open a window when outdoor air quality is good



Use a Portable HEPA Air Cleaner unit. Look for units that blow filtered air upwards

Bad Ventilation

- No ability to bring in outdoor air through HVAC.
- No opened windows or unable to open windows.
- No filtration device to help filter indoor air



Good Ventilation

- A good HVAC system can efficiently bring fresh outdoor air and filter any recirculated air
- Ceiling Fans are used to pull air upwards
- Opened windows allow fresh outdoor air into the home
- HEPA Air Cleaner is filtering the indoor air



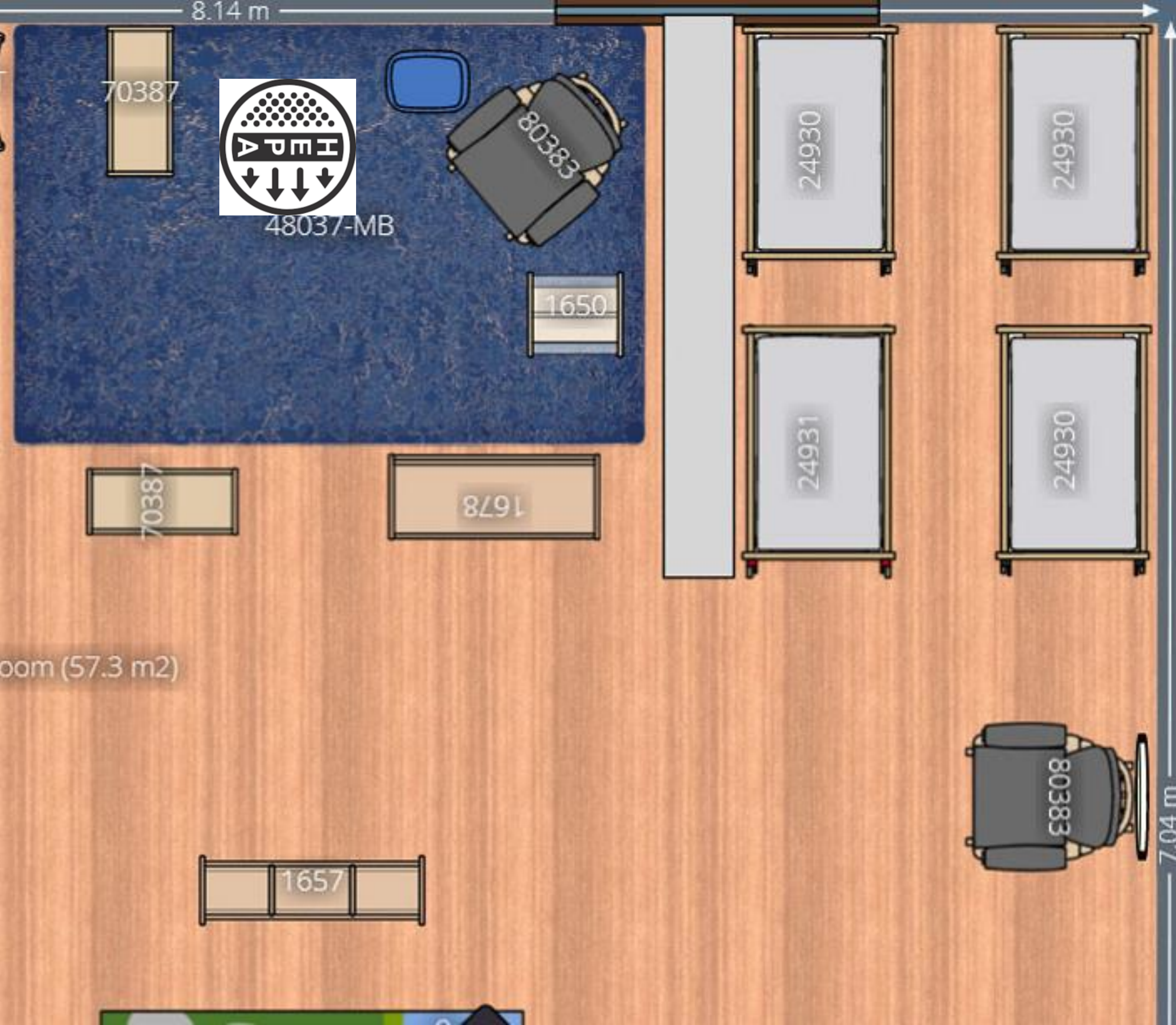
Add a little bit of body text





Tips

- Place HEPA air cleaners in areas where people spend the most time
- HEPA Air Cleaners should be at least a 1 foot away from the wall or other items



Tips

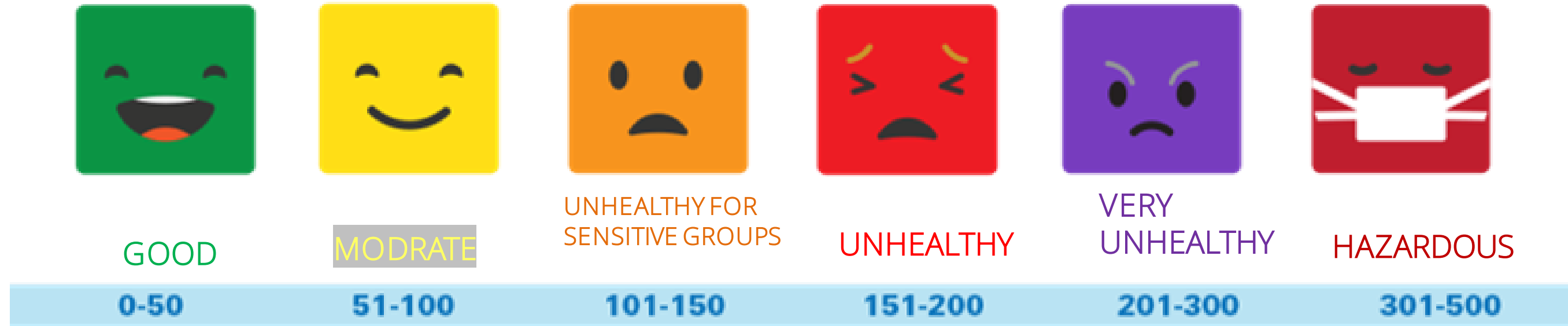
- Place HEPA air cleaners in areas where people spend the most time
- HEPA Air Cleaners should be at least a 1 foot away from the wall or other items

It is unsafe to open windows when there is poor air quality



- Underneath airplane pathways
- During wildfire smoke season
- Heavy traffic areas/industrial areas, and areas where safety is a concern.

Guide to Air Quality Index Categories



As you can see from the illustration; when the air quality index is:

Green = the air quality is good

Yellow = air quality is moderate

Orange = the air quality is unhealthy for sensitive groups

Red = the air quality is unhealthy for all groups

Purple = indicates the air quality is very unhealthy

Burgundy = indicates the air quality is hazardous

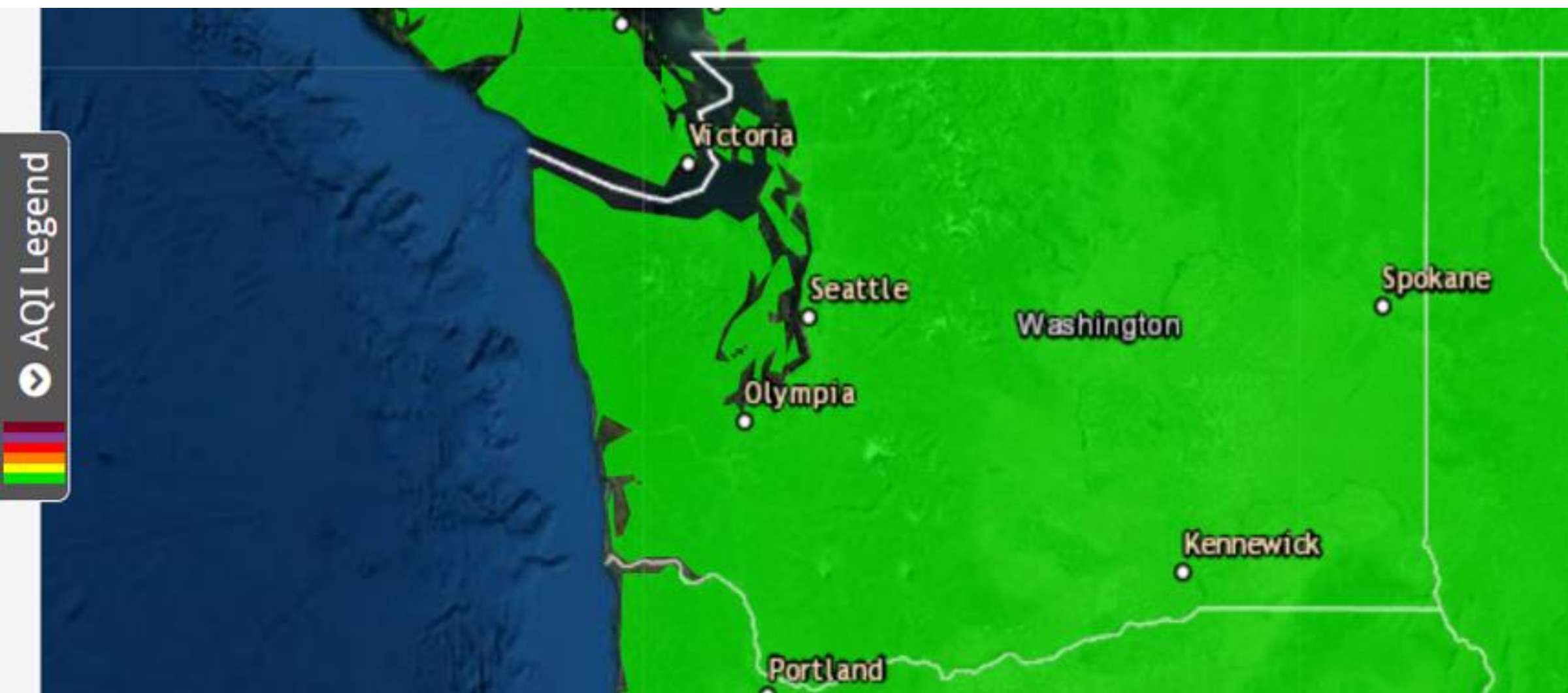
Guide to Air Quality Index Categories



Used to measure outdoor air quality for 5 major pollutants:

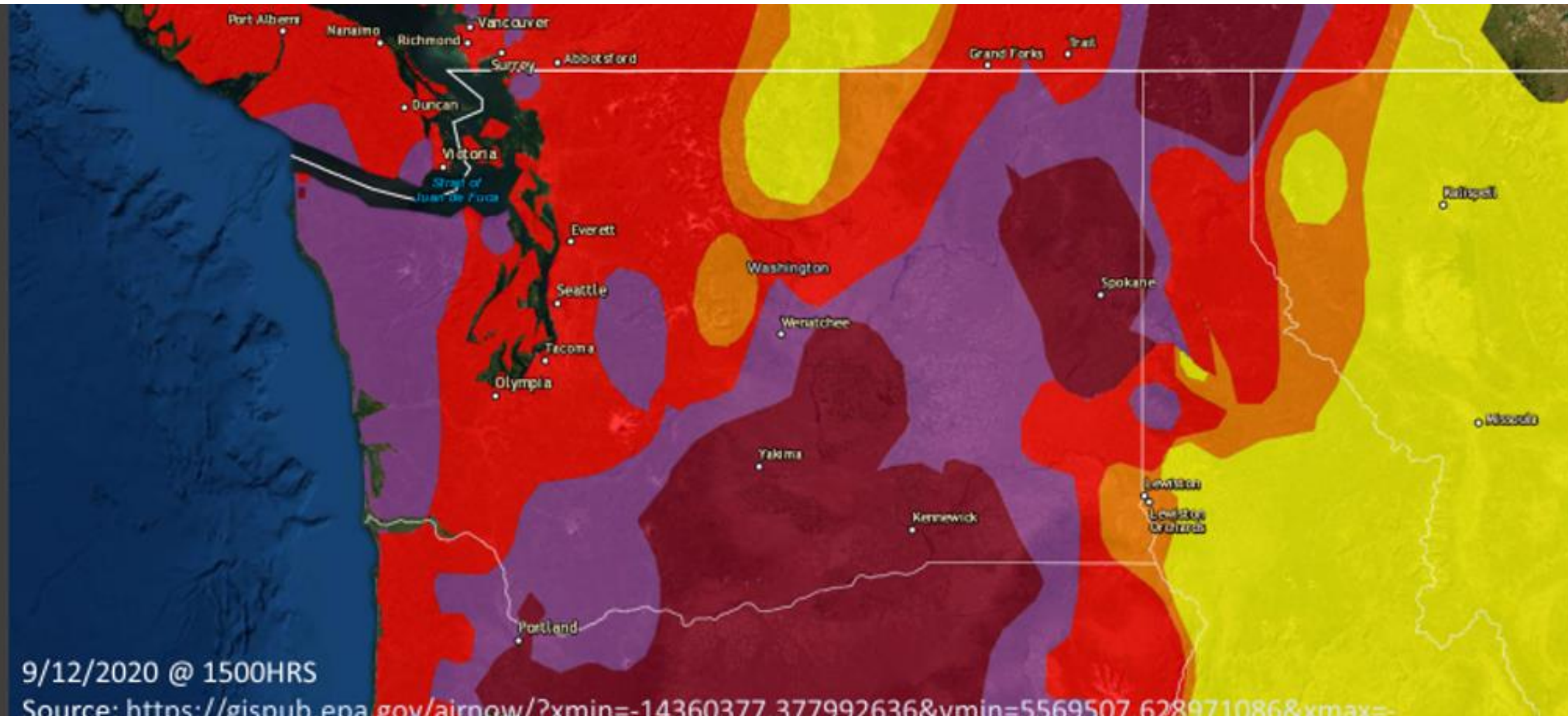
- Particulate matter (PM) - Most common air pollutant
- Ozone – vehicle emissions and industrial emissions
- Carbon monoxide – clothes dryers, water heaters,
- Sulfur dioxide – industrial emissions
- Nitrogen dioxide – vehicles and construction equipment

Guide to Air Quality Index Categories












As you can see from the illustration, the air quality index was green in Washington; hence the green indicates a good quality of air.

Guide to Air Quality Index Categories



- ❑ This image depicts various air quality index from moderate (yellow color) to hazardous (Burgundy color) air quality.

Puget Sound Clean Air Agency

King	Activity Level	Sensitive Groups	Lower-risk Adults
Kitsap	  		
Pierce			
Snohomish			
Cascades			

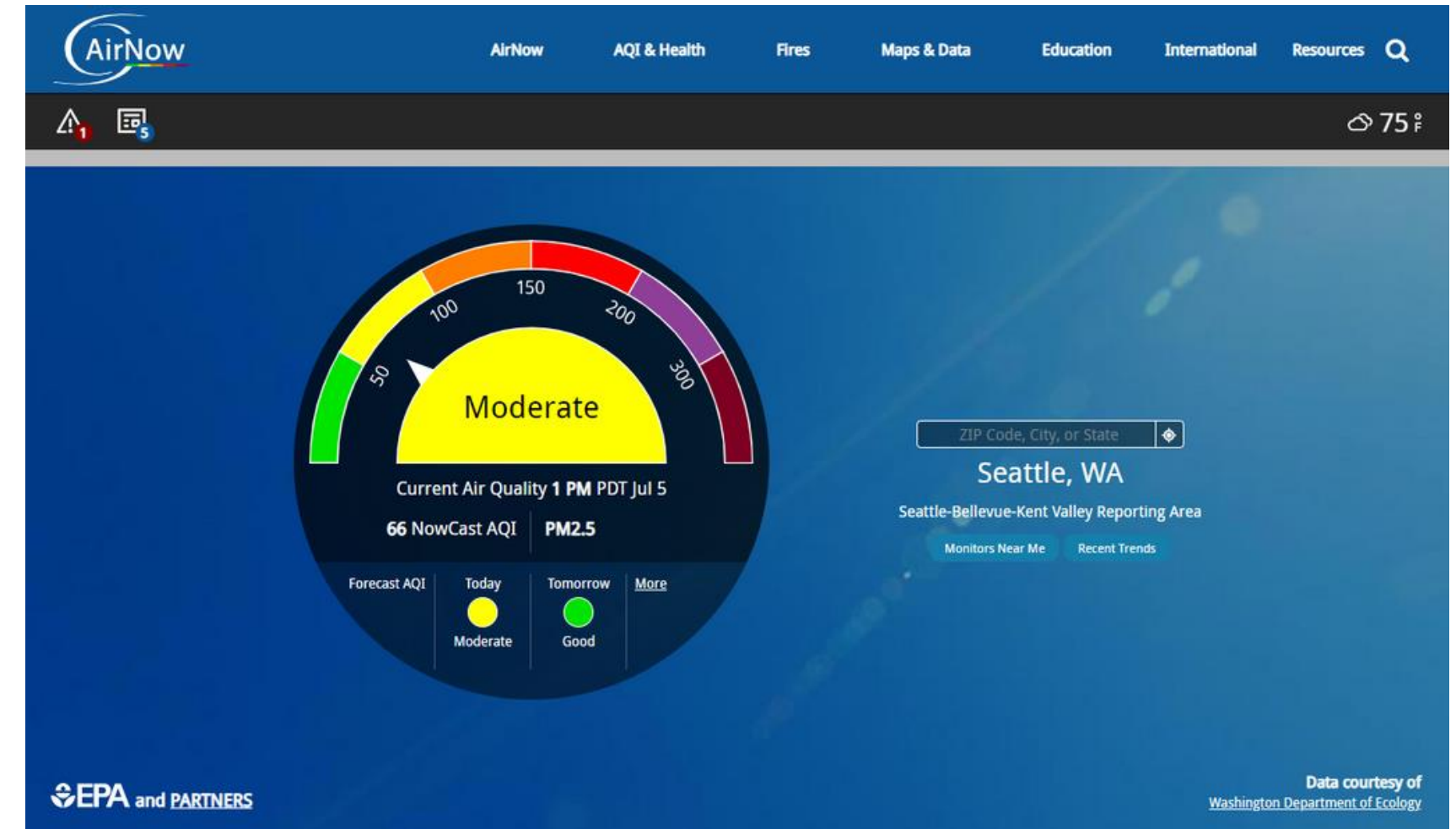
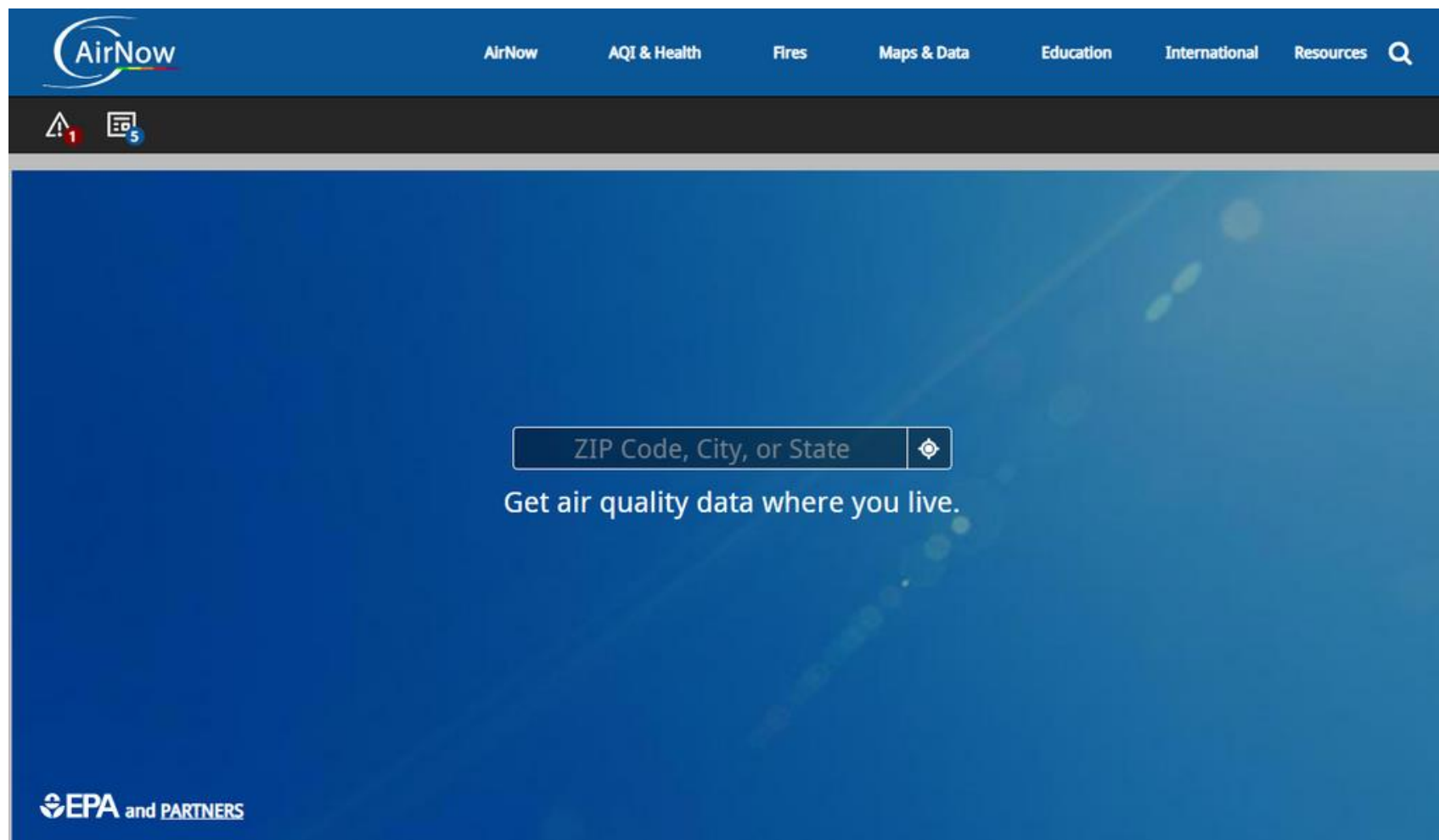
Forecast Discussion
 For July 1-5 (Fri-Tues): We'll have mostly GOOD air quality this weekend, with the possible exception of localized, shorter-term episodes of MODERATE, UNHEALTHY FOR SENSITIVE GROUPS, OR UNHEALTHY air quality due to fireworks in the evening of Independence Day (Monday), and overnight into Tuesday morning. Apart from the 4th, clouds and showers will help keep the air mixed and pollution levels from building.

☐ You can also visit the Puget Sound Clean Air Agency's website (www.pscleanair.gov) to get a forecast discussion on the air quality of the week.

www.pscleanair.gov

EPA

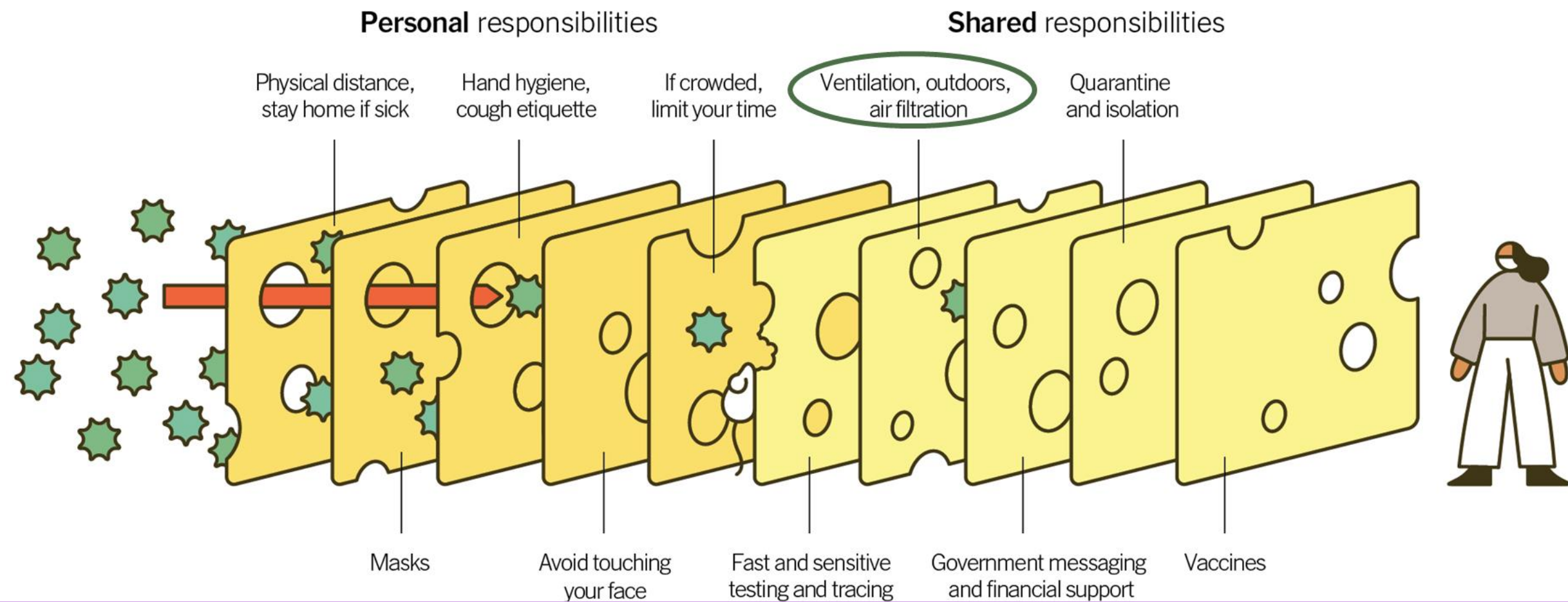
- ❑ You can also go to www.airnow.gov and put in your zip code as illustrated in the picture on the left to get air quality index of where you live. As shown in the image on the right, after entering your zip code, you will get the current air quality of area.



❑ **It's significantly important to emphasize that adding multiple layers of protection improves success. Protecting your family and clients takes more than just one answer. It takes multiple actions for our community to be safe.**

Multiple Layers Improve Success

The Swiss Cheese Respiratory Pandemic Defense recognizes that no single intervention is perfect at preventing the spread of the coronavirus. Each intervention (layer) has holes.



Source: Adapted from Ian M. Mackay (virologydownunder.com) and James T. Reason. Illustration by Rose Wong

Thank you

Public Health
Seattle & King County



Explore our website for more valuable resources:

<https://kingcounty.gov/covid/air>
