

## IAQ Word Scramble

Students unscramble words about indoor air quality (IAQ) and discuss.

### Discussion

We spend 90% of our time indoors and our indoor air can be 3-5 times more polluted than the outdoor air. Various pollutants in the air we breathe can lead to poor health.

### Activity

1. Distribute worksheet to students.
2. Give students 3-5 minutes to unscramble the words.
3. Provide answers and discuss.

### IAQ Word Scramble Answers

1. TSBESAOS → ASBESTOS
2. ALDE → LEAD
3. LOMD → MOLD
4. DNORA → RADON
5. BRCANO OODMIXNE → CARBON MONOXIDE
6. HASTAM → ASTHMA
7. ECRCAN → CANCER
8. HCGOU → COUGH
9. UDTS ITEM → DUST MITE
10. NEALGERL → ALLERGEN
11. OMYFHDEREALD → FORMALDEHYDE
12. TUDS → DUST
13. EPT RDDANE → PET DANDER
14. EZEHWIG → WHEEZING
15. IRLTACUEAPT TMTARE → PARTICULATE MATTER

### Discussion Questions

- Which words on this list is familiar to you? Why?
  - If someone mentions they or someone they know has one of the health-related words (i.e., allergy, asthma, etc.), ask if they are comfortable sharing a little bit more about it (e.g., what does it feel like to have that disease/symptom? How does it impact their daily lives? What makes it better? What makes it worse?)
  - If someone mentions one of the pollutants/allergens, ask what they know about it. Where does it come from? Where can it be found in the class or home? What dangers does it pose?

## IAQ Word Scramble

- Are there certain locations (types of buildings or even certain rooms in a building) where you think some of these pollutants are at a higher concentration?
- Are there certain occupations or trades that may be of higher risk of exposure to these pollutants?
- What actions can we all take to reduce our exposure to these pollutants?

### Discussion Points

- Consider discussing a few of the pollutants or health effects in more detail, depending on answers from the discussion questions. In alphabetical order, here are more details on each of the answer choices:
  - **Allergen:** a substance that causes an allergic reaction. Indoor air can have a lot of allergens like dust mites, pet dander, cockroaches, and mold. Exposure to these allergens can lead to allergic reactions, including allergic rhinitis (inflammation of the inside of the nose), hypersensitivity pneumonitis (inflammation of the small air sacs of the lungs), and some types of asthma.
  - **Asbestos:** a type of mineral that is resistant to heat and corrosion. Asbestos has been used in many building materials, including insulations for pipes, ceiling and floor tiles, roofing and siding shingles, etc. Extensive exposure to asbestos (primarily from work-related exposures) can cause lung cancer, mesothelioma, and asbestosis (serious non-cancer disease of the lungs).
  - **Asthma:** a chronic lung disease that makes it harder to move air in and out of your lungs. Asthma causes swelling in the airways of the lungs, making them extra sensitive when exposed to viruses, allergens, irritants or even emotions. When exposed to one of these asthma triggers, it can lead to an asthma flare-up, or asthma “attack,” where the airways swells even more and produces extra mucus. This makes it hard to breathe. It’s important to avoid asthma triggers and take medications as prescribed by your doctor. Asthma can be serious, even life-threatening if not managed properly.
  - **Cancer:** a disease in which some of the body’s cells grow uncontrollably and spread to other parts of the body. Many indoor air pollutants, including particulate matter, tobacco smoke, formaldehyde, asbestos, etc. have been linked to cancer. While many factors determine risk of developing cancer, including genetics, lifestyle, age, and overall health, exposure to carcinogens (cancer-causing substances) also plays a large role.
  - **Carbon Monoxide (CO):** a colorless, tasteless, and nearly odorless gas or liquid that is a combustion byproduct—i.e., a gas and pollutant that is produced from burning fuels. Sources of CO indoors can include: unvented kerosene or gas space heaters or stoves, leaking chimneys, gas water heaters, gas stoves, wood stoves and fireplaces, automobile exhaust, and tobacco smoke. Breathing in CO can cause fatigue, but at high concentrations can lead to impaired vision and coordination, dizziness, confusion, nausea and even death.

## IAQ Word Scramble

- **Cough:** a reflex that helps protect airways and lungs from irritants. Coughing propels air and particles out of your lungs and helps to clear the throat and airways of germs, mucus, and dust.
- **Dust:** very small particles comprised of dead skin cells, dust mite droppings and dust mite body fragments, bacteria, clothing fibers, soil particles, pollen and microscopic specks of plastic. Weekly damp dusting (using a slightly damp cloth to dust) helps to significantly reduce dust loads.
- **Dust Mite:** microscopic insect-like pests that feed on dead human skin cells and thrive in warm, humid settings. Dust mites are found in nearly all homes and are one of the major indoor triggers for people with asthma. They cling to bedding, mattresses, upholstered furniture, carpets, and curtains. These allergens can cause allergic symptoms for those who are allergic or sensitive to mites and can cause asthma attacks. Keeping humidity under 50%, using dust mite bedding encasements, and washing bedding with hot water weekly can help reduce dust mites.
- **Formaldehyde:** colorless, flammable gas with a distinct odor. It is a volatile organic compound (VOC; it vaporizes gases at room temperature) that causes cancer and other harmful health effects. Formaldehyde is used in the production of many products, including wood, paper, plywood, glues and adhesives, some paints and coatings and certain insulation materials. It can also be found in consumer products like cosmetics, dish soaps, medicines, leather treatment and fabric softeners.
- **Lead:** a toxic metal that is naturally occurring and was once regularly used in the manufacturing of common household products and gasoline. In the past, lead was added to gasoline, paints, water pipes, ceramic glazes, fertilizers and used in many industrial processes. Since the late 1970's, elimination of lead in gasoline and paints has reduced lead pollution, but lead can be found in the paint of older homes (build pre-1978) and in the surrounding soil.
- **Mold:** a fungal growth that forms and spreads on various types of damp or decaying organic matter. Mold is found everywhere, but without sufficient moisture, it cannot grow. Exposure to mold can trigger allergic reactions and asthma symptoms, but can also cause a sore throat, sneezing, congestion, coughing, wheezing, and rhinitis. To prevent mold growth, address any water problems (broken/leaky pipes, roof leaks, etc.) immediately and ensure ventilation in high moisture areas like bathrooms and kitchens.
- **Particulate Matter:** (PM) is a mixture of solid particles (dust, dirt, smoke) and liquid droplets found in the air. Some particles can be seen (e.g., smoke in the air), but others are too small to be seen. PM can come from many different sources: woodstoves, fireplaces, forest fires, construction sites, unpaved roads, factories, cars and trucks, etc. The smaller the particles, the more dangerous—PM comprised of particles less than 2.5 micrometers (also known as PM<sub>2.5</sub>) can travel deep into the lungs and can even get into the bloodstream. PM exposures can cause irritation of the eyes, lung and throat, and trouble breathing. Individuals with underlying health conditions including heart or lung disease can experience worsening of symptoms and even death.

## IAQ Word Scramble

- **Pet Dander:** dead skin cells that all mammals, like dogs, cats, guinea pigs, rabbits, hamsters, etc. shed. Dander can trigger an allergy and may produce symptoms like swollen nasal passages, runny or stuffy noses, sneezing, itchy or watery eyes, and shortness of breath. It can also trigger an asthma flare-up. Besides dander, people with pet allergies may also be allergic to the proteins found in pet saliva, urine and feces. To reduce dander, keep pets out of bedrooms, off of furniture, and vacuum and damp dust weekly.
- **Radon:** a colorless, tasteless, odorless gas that is naturally occurring and can come into buildings through cracks in walls, basement floors, foundations or other openings. Radon causes lung cancer. It's important to test homes and buildings for radon to know your risk.
- **Wheezing:** a whistling or rattling sound in the chest when breathing. Wheezing can be a symptom of lung disease, like asthma or Chronic Obstructive Pulmonary Disease (COPD). Indoor air pollutants can trigger asthma and allergies, causing wheezing and other health effects.
- There are many steps we can take to reduce or eliminate our exposure to indoor air pollutants. The three main categories are:
  - **Eliminate the source:** remove the source that's causing the pollution – e.g., dusting and vacuuming to reduce the dust, eliminating the use of air fresheners, emptying trash cans regularly, etc.
  - **Improve ventilation:** opening up doors and windows to draw in fresh, outdoor air to help dilute the polluted indoor air.
  - **Clean the air:** using a portable air cleaner or upgrading the filter in the building/home's HVAC system.
- There are many other ways we can reduce the indoor air pollutants, including cleaning the room/house with “safer” cleaning products on a regular basis, addressing any water leaks immediately (to prevent mold growth), servicing fireplaces, woodstoves annually and only burning seasoned wood, testing our homes for radon, keeping pets off furniture and beds, and keeping the building/home's humidity between 30 and 50% (to reduce chance of dust mites and mold) just to name a few.

## Indoor Air Quality Word Scramble

Name: \_\_\_\_\_

**Unscramble these common indoor air pollutants and the health problems you may experience if you are exposed to that pollutant.**

1. TSBESAOS \_\_\_\_\_
2. ALDE \_\_\_\_\_
3. LOMD \_\_\_\_\_
4. DNORA \_\_\_\_\_
5. BRCANO OODMIXNE \_\_\_\_\_
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