Environmental Medicine - Class 2 - Air

1. A family sleeps in a tightly sealed, energy-efficient home with the bedroom door closed. By morning, they wake up with headaches and feel groggy. Which factor is MOST likely contributing to this?
A. Low nitrogen levels
B. Increased carbon dioxide due to poor air exchange
C. Excess oxygen accumulation
D. Decreased humidity below 10%
(Answer: B)

2. A classroom has 30 students, poor ventilation, and rising CO_2 levels throughout the day. Which outcome is MOST likely?
A. Improved concentration and alertness
B. Reduced cognitive performance and increased fatigue
C. Increased oxygen saturation in the blood
D. Decreased breathing rate
(Answer: B)

3. During winter, a home's indoor humidity drops to 20%. Based on the presentation, what is the MOST likely consequence?
A. Reduced airborne pathogen transmission
B. No effect on respiratory health
C. Increased viability and spread of airborne pathogens
D. Immediate carbon monoxide poisoning
(Answer: C)

4. A homeowner wants to reduce the spread of airborne viruses in their house. Which strategy aligns BEST with the presentation?
A. Lower humidity to below 20%
B. Keep windows closed at all times
C. Increase use of scented cleaning sprays
D. Maintain indoor humidity between 40–60%
(Answer: D)

5. A person cooks a stir-fry on a gas stove with no ventilation. Immediately after cooking, indoor air quality measurements spike. What is the BEST explanation?
A. Cooking increases oxygen levels beyond safe limits
B. Cooking eliminates airborne pollutants
C. Cooking reduces humidity to zero
D. Cooking releases large amounts of ultrafine particles into the air
(Answer: D)

6. A student installs a HEPA air purifier in their bedroom but still notices strong chemical smells from new furniture. Why?
A. HEPA filters increase VOC production
B. HEPA filters only work outdoors

C. HEPA filters do not remove gases or VOCs effectively
D. HEPA filters only function at high humidity
(Answer: C)

7. A home has very high humidity (>70%) for several weeks. What indoor air issue becomes MOST likely?
A. Increased oxygen production
B. Mold growth and biological contamination
C. Decreased particulate matter
D. Elimination of VOCs
(Answer: B)

8. Two homes are compared:
Home A: older, drafty, lots of air exchange
Home B: new, tightly sealed, energy-efficient
Which statement is MOST accurate?
A. Home B will always have cleaner air
B. Home A will always have higher CO_2 levels
C. Both homes will have identical air quality
D. Home B is more likely to accumulate indoor pollutants without proper ventilation
(Answer: D)

9. A crowded movie theater shows a strong buildup of human-emitted compounds (like isoprene and VOCs). What does this demonstrate?
A. Humans are a significant source of indoor air pollutants
B. Only outdoor air contributes to indoor air chemistry
C. Buildings eliminate all human emissions
D. VOCs only come from cleaning products
(Answer: A)

10. A student wants to improve indoor air quality using filtration. Which combination is MOST effective based on the presentation?
A. HEPA filter alone
B. Carbon filter alone
C. HEPA filter combined with carbon filtration
D. No filtration, only humidity control
(Answer: C)

Home Activity Key

Activity 1 – Spot the Higher Risk Scenario

Instructions:
For each pair, circle which situation has the higher air quality risk.

1. Bedroom door closed overnight vs bedroom door open with airflow
2. Cooking on a gas stove with no fan vs cooking with a vent hood on
3. Home at 45% vs Home with humidity at 20%
4. New furniture in a sealed room vs older furniture in a ventilated room
5. Classroom with active ventilation vs Crowded classroom with windows closed
6. Running a HEPA filter only vs HEPA + carbon filter
7. Occasional use in a large ventilated space vs Burning candles daily in a small room
8. Home with a clean HVAC filter vs home with a clogged filter

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Activity 2 – Match the Situation to the Best Air Strategy

Instructions:
Match each situation with the BEST action.