Why Breathing Changes

Trace causes and effects in four respiratory conditions

HAP.12.5 "Research and analyze the causes and effects of various pathological conditions (e.g., asthma, bronchitis, pneumonia, and COPD)."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline a cause or trigger for each condition, circle the part of the respiratory system it affects, and number one resulting effect. Use your marks to compare how the conditions change breathing.

Four Patients, Different Causes

1. At a school clinic, two students both cough, but their airways may be affected in different ways. In asthma, sensitive bronchial tubes narrow when muscles tighten and their lining swells. Triggers such as pollen, exercise, or cold air can start an episode, making it hard to move air and sometimes causing wheezing. Asthma is a long-term condition, although symptoms may come and go. In acute bronchitis, often caused by a virus, the bronchial tubes become inflamed and make extra mucus. The result is a cough that may linger even after other cold symptoms fade.

2. A third patient has a fever, cough, and fast breathing after a lung infection. Pneumonia affects the tiny air sacs, called alveoli, rather than mainly the larger bronchial tubes. Viruses or bacteria can cause pneumonia. Infected air sacs may fill with fluid and inflammatory cells, leaving less room for air. Oxygen then moves into the blood less effectively, which can cause shortness of breath. A person with acute bronchitis may also feel breathless, but its main site of inflammation is the bronchial tubes. A clinician uses symptoms, an examination, and sometimes tests to tell these illnesses apart.

3. At the same clinic, an older adult reports years of smoking and increasing trouble walking uphill. Repeated exposure to tobacco smoke can lead to chronic obstructive pulmonary disease, or COPD. In COPD, long-lasting damage may include inflamed, mucus-producing airways and destruction of alveolar walls. Narrowed airways and reduced lung elasticity make it difficult to empty the lungs, so air gets trapped. Damage to air sacs also reduces the surface available for oxygen to enter the blood. Unlike a brief infection, COPD usually develops over years and does not fully reverse, although treatment and avoiding smoke can reduce symptoms and slow worsening.

2 ANSWER WITH EVIDENCE

Use the passage

1. How could pollen cause wheezing in a person with asthma? Trace the cause through the change in the bronchial tubes.

2. A virus can cause either acute bronchitis or pneumonia. How does the main site affected differ, and what effect does the passage emphasize for each?

3. Why can fluid in the alveoli cause shortness of breath in a person with pneumonia?

4. Trace two ways long-term damage from tobacco smoke can make breathing difficult in COPD.

3 YOUR TURN

Your own words

A student with asthma develops acute bronchitis after a viral infection. In four sentences, explain how each condition can make breathing harder, predict one symptom they may share, and name one action that could lower the chance of catching a respiratory virus.

ANSWER KEY

Why Breathing Changes

HIGH SCHOOL · HAP.12.5

PART 1 · READ AND MARK

Underline a cause or trigger for each condition, circle the part of the respiratory system it affects, and number one resulting effect. Use your marks to compare how the conditions change breathing. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How could pollen cause wheezing in a person with asthma? Trace the cause through the change in the bronchial tubes.	**Pollen can trigger an asthma episode. Muscles tighten and the bronchial lining swells, narrowing the tubes and making airflow difficult, which can cause wheezing.**
2	A virus can cause either acute bronchitis or pneumonia. How does the main site affected differ, and what effect does the passage emphasize for each?	**Acute bronchitis mainly inflames the bronchial tubes and produces extra mucus and coughing. Pneumonia affects the alveoli, where fluid and inflammatory cells reduce oxygen movement into the blood.**
3	Why can fluid in the alveoli cause shortness of breath in a person with pneumonia?	**Fluid leaves less room for air in the alveoli, so oxygen moves into the blood less effectively.**
4	Trace two ways long-term damage from tobacco smoke can make breathing difficult in COPD.	**Narrowed airways and reduced lung elasticity make the lungs hard to empty, trapping air. Damage to alveolar walls reduces the surface available for oxygen to enter the blood.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Asthma can narrow the student's bronchial tubes as muscles tighten and their lining swells. Viral bronchitis inflames those tubes and adds mucus, making airflow more difficult. The student may cough, and both conditions can contribute to shortness of breath. Washing hands regularly can lower the chance of catching some respiratory viruses.

Accept accurate cause-to-effect explanations in the student's own words. For Part 3, accept another reasonable action that reduces exposure to respiratory viruses.