

Exercise Asthma and Smoking

KS3 Biology · Follows the national curriculum

Name _____ Class _____ Date _____

1. Worked example

Why does breathing rate increase during exercise?

Step 1 · Muscles work harder

Muscle cells respire faster to release more energy.

Step 2 · More gas exchange needed

They need more oxygen and produce more carbon dioxide.

Step 3 · Response

Breathing becomes faster and deeper so more oxygen enters the blood and more carbon dioxide is removed.

Answer: To supply more oxygen and remove more carbon dioxide for faster respiration

Check: Heart rate rises too, to carry the gases faster.

2. Now try one with the steps

Use the graph above: by how much did the untrained person's breathing rate rise from rest to its highest value?

Step 1 · Read the values

Step 2 · Subtract

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. What happens to your breathing rate when you exercise? [1]

2. Name the addictive drug in tobacco smoke. [1]

3. Which substance in cigarette smoke causes cancer? [1]

4. Which gas in cigarette smoke reduces the amount of oxygen the blood can carry? [1]
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5. Give TWO things that can trigger an asthma attack. [2]
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6. During an asthma attack, what happens to the bronchioles? [1]
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7. Why does a smoker often cough? [2]
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8. Give ONE long-term effect of regular exercise on the gas exchange system. [1]
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9. A trained runner's breathing rate was 14 at rest and 24, 28, 30, 30 during exercise. What was the highest rate, in breaths per minute? [1]
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10. Emphysema breaks down the walls of the alveoli. Explain why this makes a person breathless. [2]
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11. A runner's breathing rate went from 15 to 33 breaths per minute. What is the percentage increase? [2]
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12. Suggest why smoking during exercise would make a person tire more quickly. [2]
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13. Recovery time is the time for breathing rate to return to normal. Explain why a shorter recovery time shows better fitness. [2]
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14. Vapes contain nicotine but no tar or carbon monoxide. Explain why vaping is still not recommended for young people. [2]
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4. Before you hand it in

"Nicotine causes lung cancer."

Tar contains the cancer-causing chemicals. Nicotine causes addiction.

"Asthma happens because the lungs are too small."

The bronchioles narrow because their muscles contract, the lining swells and extra mucus is made.

Describing a graph without data.

Quote numbers with units: 'breathing rate rose from 14 to 30 breaths per minute during exercise'.