KS3 SCIENCE · BIOLOGY

Breathing and gas exchange: exam questions

Name _____
Total: 21 marks

1 Air is breathed in through the nose. Describe the path it takes from the trachea to the place where gas exchange happens. **[3 marks]**

2 Give two ways in which alveoli are adapted for gas exchange. **[2 marks]**

3 Describe what the diaphragm and the muscles between the ribs do when you breathe in. **[2 marks]**

4 Explain why air moves into the lungs when the chest gets bigger. **[2 marks]**

5 State the difference between breathing and respiration. **[2 marks]**

6 Ada and Cara each take the deepest breath they can, then breathe out as much air as they can. Ada breathes out 2.6 litres and Cara breathes out 3.4 litres. Calculate how much more air Cara breathes out. **[1 mark]**

7 A student's breathing rate is 15 breaths per minute at rest and 40 breaths per minute straight after a run. Explain why the rate went up. **[2 marks]**

8 Describe what happens to the airways in an asthma attack, and explain how a reliever inhaler helps. **[3 marks]**

9 Name the substance in tobacco smoke that causes cancer, and the gas in tobacco smoke that reduces the amount of oxygen the blood can carry. **[2 marks]**

10 State where most of the stomata on a leaf are found, and name one gas that passes through them. **[2 marks]**

KS3 SCIENCE · BIOLOGY

Breathing and gas exchange: mark scheme

Total: 21 marks

1 [3 marks]

- Along a bronchus (accept: the bronchi) **(1)**
- Then through the bronchioles **(1)**
- To the alveoli (accept: air sacs) **(1)**

The parts must be in the right order for full marks.

2 [2 marks]

- Any one of: a very large surface area (there are millions of them); walls only one cell thick; a good blood supply (covered in capillaries) **(1)**
- A second, different one from the same list **(1)**

3 [2 marks]

- The diaphragm contracts (accept: flattens, or moves down) **(1)**
- The intercostal muscles contract and pull the ribs up and out **(1)**

4 [2 marks]

- The volume inside the chest increases, so the pressure inside falls **(1)**
- The pressure of the air outside is now higher, so air is pushed in (accept: air moves from higher pressure to lower pressure) **(1)**

5 [2 marks]

- Breathing is the movement of air into and out of the lungs **(1)**
- Respiration is a chemical reaction in cells that releases energy **(1)**

6 [1 mark]

- 0.8 litres **(1)**

7 [2 marks]

- The muscle cells respire faster (accept: they need to release more energy) **(1)**
- So they need more oxygen (accept: there is more carbon dioxide to get rid of) **(1)**

8 [3 marks]

- The muscles around the airways tighten (accept: contract) **(1)**
- The airways get narrower, so less air can get through (accept: the lining swells, or extra mucus is made) **(1)**
- The medicine from the inhaler relaxes the muscles, so the airways open up again **(1)**

9 [2 marks]

- Tar **(1)**
- Carbon monoxide **(1)**

10 [2 marks]

- On the underside (accept: the bottom) of the leaf **(1)**
- Carbon dioxide, oxygen or water vapour (any one) **(1)**