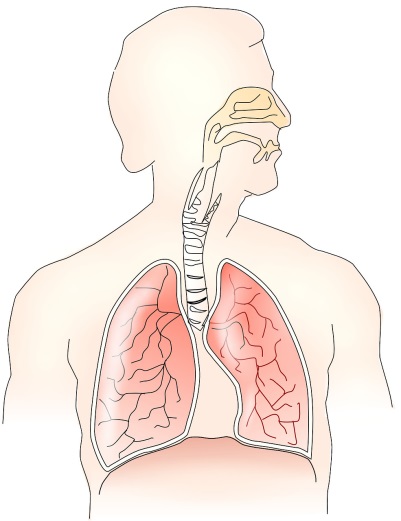
**The human gas exchange system**



The boxes below contain the names of some structures in the human body.

Put a tick next to each structure that is **part of the human gas exchange system**.

Then draw straight lines to join each **structure** you have ticked to its **function**.

One has been done for you.

|  |  |  |
| --- | --- | --- |
| **Structure** |  | **Function** |
| Lungs |  | To allow air to travel from the lungs to the heart. |
|  |  |  |
| Heart |  | To allow air to travel from the nose and mouth to the bronchi. |
|  |  |  |
| Trachea ✓ |  | To allow air to travel from the trachea to the heart. |
|  |  |  |
| Stomach |  | To allow air to travel from the trachea to the lungs. |
|  |  |  |
| Bronchi |  | To absorb oxygen from air and release carbon dioxide from the blood. |
|  |  |  |
|  |  | To absorb carbon dioxide from air and release oxygen from the blood. |

*Biology> Big idea BCL: The cellular basis of life > Topic BCL2: From cells to organ systems > Key concept BCL2.2: Supplying cells – the human circulatory, digestive and gas exchange systems*

|  |
| --- |
| **Diagnostic question** |
| **The human gas exchange system** |

**Overview**

|  |  |
| --- | --- |
| Learning focus: | Human life depends upon the tissues and organs of the circulatory, digestive and gas exchange systems working together to support the life processes of the cells from which we are made. |
| Observable learning outcome: | Describe simply the structures and functions of the human gas exchange system. |
| Question type: | Linking ideas |
| Key words: | gas exchange system |

**What does the research say?**

Unlike the digestive system and the circulatory system, students are less likely to have been formally taught about the gas exchange system before age 11; however, they should be familiar with the lungs as organs of the body (Department for Education, 2013). One study found that young children up to age 7 frequently included other organs in the gas exchange system, in particular the stomach and heart (García-Barros, Martínez-Losada and Garrido, 2011).

Students at age 11 are usually aware that ‘air tubes’ link the mouth to the lungs, and that humans have two lungs located in the chest (Bartoszeck, Machado and Amann-Gainotti, 2011; Allen, 2014). However, some students also believe that similar ‘air tubes’ connect the lungs to the heart, and that this explains how oxygen from air enters the blood.

**Ways to use this question**

Students should complete the question individually. This could be a pencil and paper exercise, or you could use the presentation with an electronic voting system or mini white boards.

*Differentiation*

You may choose to read the boxes to the class, so that everyone can focus on the science. In some situations it may be more appropriate for a teaching assistant to read for one or two students.

**Expected answers**

|  |  |  |
| --- | --- | --- |
| **Structure** |  | **Function** |
| Lungs ✓ |  | To allow air to travel from the lungs to the heart. |
|  |  |  |
| Heart |  | To allow air to travel from the nose and mouth to the bronchi. |
|  |  |  |
| Trachea ✓ |  | To allow air to travel from the trachea to the heart. |
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| Stomach |  | To allow air to travel from the trachea to the lungs. |
|  |  |  |
| Bronchi ✓ |  | To absorb oxygen from air and release carbon dioxide from the blood. |
|  |  |  |
|  |  | To absorb carbon dioxide from air and release oxygen from the blood. |

**How to respond - what next?**

If there is a range of answers, you may choose to respond through structured class discussion. Ask one student to explain why they gave the answer they did; ask another student to explain why they agree with them; ask another to explain why they disagree, and so on. This sort of discussion gives students the opportunity to explore their thinking and for you to really understand their learning needs. Responses often work best when the activities involve paired or small group discussions, which encourage social construction of new ideas through dialogue.

If students have misunderstandings about which structures are part of the gas exchange system, and what their main functions are, it may be helpful to respond with a small group discussion activity in which students have to work together to stick the structures onto a poster or a T-shirt and explain their functions (Allen, 2014). The focus of the activity should be on group discussion to reach a consensus on where to place the structures and how to explain their functions. It is through the discussions that students can check their understanding and develop their explanations. Listening in to the conversations of each group will often give you insights into how your students are thinking. After their discussions, each group should be prepared to report the key points of their discussion to another group, or to the class.

**Acknowledgments**

Developed by Alistair Moore (UYSEG).

Images: pixabay.com/OpenClipart-Vectors (145696)

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