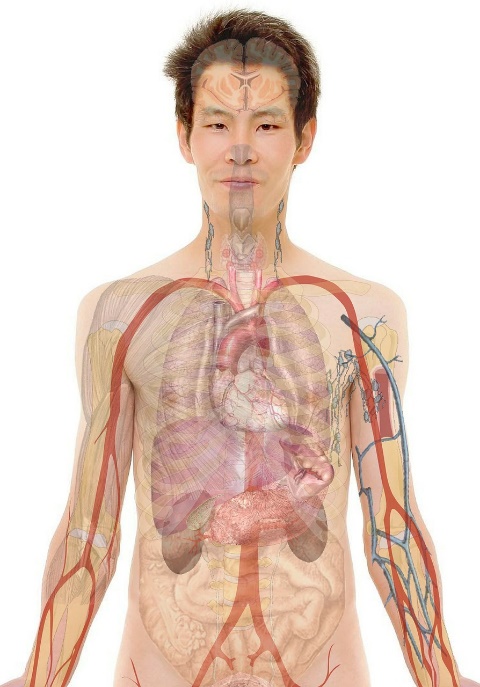
**Body cells**



Which statement about the human body is true?

|  |  |
| --- | --- |
| **A** | The body contains cells. |
| **B** | The body is a cell. |
| **C** | The body is made up of cells. |
| **D** | Cells are only found between the organs. |

*Biology> Big idea BCL: The cellular basis of life > Topic BCL2: From cells to organ systems > Key concept BCL2.1: Working together – cells, tissues and organ systems*

|  |
| --- |
| **Diagnostic question** |
| **Body cells** |

**Overview**

|  |  |
| --- | --- |
| Learning focus: | The cells of multicellular organisms are organised into tissues, organs and organ systems that work together to keep the cells alive. |
| Observable learning outcome: | Recall that the parts of a multicellular organism are made up of cells. |
| Question type: | Simple multiple choice |
| Key words: | cell, organs |

**What does the research say?**

Research (e.g. Dreyfus and Jungwirth, 1988; Clément, 2007) has identified a number of misunderstandings that students have about cells, including that the bodies of humans and other animals *contain* cells, perhaps floating in a ‘soup’ of body fluids, rather than being *made up of* cells. Some common practices that may introduce or reinforce these misunderstandings include overuse of typical textbook depictions of animal cells as circular and isolated (in contrast to plant cells, which are usually depicted as polygonal and adjacent to other cells), and using only blood cells as examples of human cells.

**Ways to use this question**

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

The answers to the question will show you whether students understand that organisms are made up of cells (rather than that they contain cells floating between the organs or in a ‘soup’ of body fluids).

*Differentiation*

You may choose to read the question 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 answer**

C - The body is made up of cells.

**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 the cellular nature of organisms, key concept BCL1.2 *Cells and cell structures* provides diagnostic questions and response activities that will help to probe and build understanding. The following BEST ‘response activity’ from that key concept, in particular, could be used in follow-up to this diagnostic question:

* Response activity: Cell drawings

Students who chose answer B (“The body is a cell”) may have misunderstandings about the size and scale of cells. Key concept BCL1.3 *Cell shape and size* provides diagnostic questions to further probe these misunderstandings and response activities to help students overcome them.

**Acknowledgments**

Developed by Alistair Moore (UYSEG).

Images: pixabay.com/geralt (254129)

**References**

Clément, P. (2007). Introducing the cell concept with both animal and plant cells: a historical and didactic approach. *Science & Education,* 16(3-5)**,** 423-440.

Dreyfus, A. and Jungwirth, E. (1988). The cell concept of 10th graders: curricular expectations and reality. *International Journal of Science Education,* 10(2)**,** 221-229.