**Can they catch it?**



**Jordan**

**Max**

Jordan is playing a card game with his grandfather Max.

**Part 1**

Jordan has a cold.

1. Can Jordan pass his cold to his grandfather Max?

|  |  |
| --- | --- |
| **A** | No. |
| **B** | Yes, if they sit close together. |
| **C** | Yes, if they touch each other or the same cards. |
| **D** | Yes, if Jordan sneezes and Max breathes it in. |

1. How would you explain your answer to question 1?

|  |  |
| --- | --- |
| **A** | Max can get the cold if Jordan’s cold germs get onto his skin. |
| **B** | Max can get the cold if Jordan’s cold germs get inside Max’s body. |
| **C** | A cold is not caused by germs, it is caused by bad diet and lack of exercise. |
| **D** | A cold is not caused by germs, it is caused by going outside without a coat. |



**Jordan**

**Max**

Jordan is playing a card game with his grandfather Max.

**Part 2**

Max has heart disease.

1. Can Max pass his lung disease to Jordan?

|  |  |
| --- | --- |
| **A** | No. |
| **B** | Yes, if they sit close together. |
| **C** | Yes, if they touch each other or the same cards. |
| **D** | Yes, if Max coughs and Jordan breathes it in. |

1. How would you explain your answer to question 1?

|  |  |
| --- | --- |
| **A** | Jordan can get the heart disease if Max’s germs get onto his skin. |
| **B** | Jordan can get the heart disease if Max’s germs get inside Jordan’s body. |
| **C** | Heart disease is not caused by germs, it is caused by bad diet and lack of exercise. |

*Biology > Big idea BHD: Health and disease > Topic BHD1: What are health and disease? > Key concept BHD1.2: Disease*

|  |
| --- |
| **Diagnostic question** |
| **Can they catch it?** |

**Overview**

|  |  |
| --- | --- |
| Learning focus: | The good health of organisms can be compromised by infectious and non-infectious diseases, which can be caused by germs, lifestyle, environment, or information in the genome. |
| Observable learning outcome: | Distinguish between infectious and non-infectious diseases. |
| Question type: | Two-tier multiple choice |
| Key words: | Health, disease |

**What does the research say?**

Children’s conceptions of the causes of illnesses will affect their understanding of whether (and how) diseases can be passed on to other organisms. Bibace and Walsh (1980) describe six stages of children’s developing understanding of illness in a widely accepted model as follows:

|  |  |  |
| --- | --- | --- |
| **Stage of understanding** | **Conception of what causes illness** | **Conception of how or why illness arises** |
| Phenomenism | Something external to the body and remote from it in space or time (e.g. the Moon) | ‘Magically’, or no concept |
| Contagion | Something external to the body but in close proximity to it (e.g. a sick person sitting nearby) | ‘Magically’, or ‘immanent justice’ (punishment for misbehaviour), or no concept |
| Contamination | Something external to the body that has touched it | Physical contact with the cause (e.g. germs) |
| Internalisation | Something external to the body that is taken inside the body | Inhaling or swallowing the cause (e.g. germs); no concept of effects on body systems |
| Physiological | Various causes that affect internal structures, including lifestyle or something external to the body that is taken inside it | Disruption to normal functioning of body cells/organs |
| Psychophysiological | Various causes that affect internal structures, including lifestyle, or something external to the body that is taken inside it, or psychological processes such as stress | Sophisticated explanations of how internal systems are affected (e.g. link between stress, blood pressure and effects on the blood vessels and heart in cardiovascular disease) |

Various researchers have investigated children’s ability to differentiate between infectious and non-infectious diseases, including some serious diseases such as HIV/AIDS and cancer (Sigelman et al., 1993; Bares and Gelman, 2008). Bares and Gelman (2008) found that children aged 5 reasoned about cancer and colds in similar ways, including that they were both contagious; by age 7 the children began to distinguish between cancer and colds in some aspects, including the seriousness, length and prognosis of the diseases; only at age 10 did the children begin to understand that cancer was not transmitted by contagion. Sigelman et al. (1993) noted that when children lack knowledge of a specific disease, they tend to draw upon their experiences with common childhood diseases such as colds and measles, and thus assume that all diseases are infectious; this can also lead them to assume that risk factors for common infectious diseases are also risk factors for non-infectious diseases.

**Ways to use this question**

Students should complete the questions 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.

*Differentiation*

You may choose to read the questions and answers 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**

Students may believe that more than one answer is true in each part. Rather than testing whether students can pick the ‘correct’ answer, these questions are designed to help you to work out where students’ understanding could best be placed within the stages described in the table on page 3.

*Part 1*

1. **C** – Yes, if they touch each other or the same cards.

OR

**D** – Yes, if Jordan sneezes and Max breathes it in.

1. **B** – Max can get the cold if Jordan’s cold germs get inside Max’s body.

*Part 2*

1. **A** – No.
2. **C** – Heart disease is not caused by germs, it is caused by bad diet and lack of exercise.

**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 (meaning making) through dialogue.

If students have misunderstandings about the causes of infectious and non-infectious diseases, topics BHD2 *Human lifestyles and health* and BHD3 *Infectious disease* provide diagnostic questions and response activities to further probe and develop students’ understanding.

**Acknowledgments**

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Images: pixabay.com/mohamed\_hassan (2656412)

**References**

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