

## Teacher notes

### Controlling infectious disease

- 1 A 2  
B 1  
C 4  
D 3 *(1 mark each)*
- 2 B *(1 mark)*
- 3 C *(1 mark)*
- 4 A *(1 mark)*
- 5 C *(1 mark)*
- 6 a) Mumps *(1 mark)*  
Rubella (German measles) *(1 mark)*
- b) The virus has been weakened/made inactive. *(1 mark)*
- c) Antibodies. *(1 mark)*
- d) • The injection of MMR vaccine introduces an inactive form of the measles virus into the body.  
• White blood cells respond to antigens on the surface of the measles virus by developing antibodies that are specific to the measles virus.  
• Should living measles virus enter the body at some later date, white blood cells will rapidly produce these antibodies again.  
• The antibodies which destroy the measles viruses that have infected the body before they can multiply and cause harm. *(1 mark for each)*
- e) Viruses live inside body cells and antibiotics are not able to reach them and so cannot destroy them. *(1 mark)*
- f) Parents were afraid of side-effects from the MMR vaccine (as a result of research, now discredited, suggesting a link between the MMR vaccine and autism). *(1 mark)*

- 7 a) (i) Viruses live inside cells where antibiotics cannot reach them and hence any antibiotic taken would not be effective. (1 mark)
- (ii) Different antibiotics are designed to work in different ways depending on the type of disease. Someone else's antibiotic might not be effective against your disease. (1 mark)
- (iii) To prevent more resistant strains of bacteria developing, it is important only to use antibiotics when they are essential. (1 mark)
- (iv) The length of the course of drugs is calculated to kill all the pathogens it is aimed at. Stopping the course early allows the most resistant bacteria to survive and multiply. (1 mark)
- b) • Within any population of bacteria there are many different types that have evolved over many years by natural mutation.
- An antibiotic will kill almost all these bacteria except the few that have a natural mutation that makes them resistant to the antibiotic.
- Under normal circumstances the surviving bacteria possess no advantage and so the body's immune system destroys them.
- However, if the antibiotic is present there is a greater chance that resistant bacteria will survive while the non-resistant ones are killed.
- In time, and with continued use of the antibiotic, all the non-resistant bacteria are destroyed and only the resistant strains survive.
- (1 mark for each)