

Contents

	<i>Page no.</i>
B2 Keeping healthy – Foundation Workbook answers	B2-F2
B2 Keeping healthy – Higher Workbook answers	B2-F6

B2 Keeping healthy – Foundation Workbook answers

1	a	Headings: virus, bacterium, fungus
	b	Missing words: chemicals, reproduce, destroy, acid, microorganisms
	c	Warm, moist, available nutrients
	d	1 hr 20 mins – 16 bacteria 1:40 – 32 2:00 – 64 2:20 – 128 2:40 – 256 3:00 – 512
	e	Missing words: (top left) poisons, toxins; (bottom left) cell; (box) damage, symptoms
2		Missing words: markers, white, antibodies, engulf, digest
3	a	Correctly labelled diagram, with complementary antibodies drawn over the markers at X.
	b	The white blood cell that recognizes the foreign marker must multiply. The white blood cells then have to make enough antibodies to fight the infection.
	c	Missing words: memory, markers, antibodies, microorganisms, immune
4	a	...weakened, dead, or damaged organisms.
	b	For example: <ul style="list-style-type: none"> White blood cells recognize foreign markers from the microorganism in the vaccine. They produce antibodies against this type of microorganism. The child is now immune to this microorganism. White blood cells that recognize the invading microorganisms are already in the blood. They detect the microorganisms immediately. The correct antibodies are quickly produced. The antibodies destroy the invading microorganisms before they can reproduce and cause illness.
	c	Diagram: antibody for virus B has a V-shaped end, complementary to the black markers on the outside of the virus. The antibody produced to fight virus A will not 'fit' the markers on virus B. Other white blood cells will only engulf and destroy the microorganisms that antibodies stick to.
5	a	Rows 1 and 2 of the table
	b	Rows 3 and 4 of the table
	c	<ul style="list-style-type: none"> Who should decide whether or not a child is vaccinated? Student's personal view, with explanation.

Further guidance

	d	<ul style="list-style-type: none"> Parents have the right to protect their child against possible harmful side-effects of vaccinations. (i) Doctors/governments because they have to decide what is best for the whole population, or (ii) Parents whose children have been vaccinated – their family has taken the risk of possible harmful effects from the vaccine; it is not fair for other families to benefit from this (reduced risk of an unvaccinated individual contracting the disease if majority of population are vaccinated) without also taking the risk ('free-loading'). Parents/guardians because they have to decide what is best for their child
	e	<p>Arguments for:</p> <ul style="list-style-type: none"> if lots of children are not vaccinated, this puts others at risk almost everyone who has the vaccination notices no harmful effects if they do, the effects are usually very mild if they are not vaccinated and get measles, they could be severely disabled measles can be fatal, so vaccination can save lives an outbreak of measles would be costly to the NHS and to society <p>Arguments against:</p> <ul style="list-style-type: none"> a very small number of people do have serious harmful effects from a vaccine parents should be able to decide what is best for their child
6	a	Septic wound, athlete's foot, cystitis, tuberculosis
	b	Diagram in 2 – some bacteria drawn in the circle (not as many as in circle 1); missing word: kills Diagram 3 – no bacteria drawn in the circle; missing word: all
7	a	... a bacterium that is no longer killed by the antibiotic
	b	Diagram 1 – lots of bacteria, as in question 6b diagram 1 Diagram 2 – some bacteria Diagram 3 – lots of bacteria. Explanation: Some of the bacteria are more resistant to the antibiotic. They survive and reproduce.
	c	<ul style="list-style-type: none"> This way you will kill all the bacteria. If you don't, then those bacteria that are more resistant to the antibiotic will survive. The infection may come back. The antibiotics won't work because colds are caused by viruses. Over-use of antibiotics increases the chance of antibiotic-resistant bacteria growing. So in future, the antibiotics would not have an effect.
8	a	<ul style="list-style-type: none"> How safe the drug is How well the drug works

Further guidance

	b	<table border="1"> <tbody> <tr> <td>1</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>2</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>3</td> <td>✓</td> <td></td> </tr> <tr> <td>4</td> <td></td> <td>✓</td> </tr> </tbody> </table>	1	✓	✓	2	✓	✓	3	✓		4		✓
1	✓	✓												
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4		✓												
	c	Testing on cells is not enough – we need to know if a drug is safe and effective to use on whole organisms. It is safer for humans to find out as much as possible about this by testing on other animals first.												
9	a	Missing numbers: 70, 100 000												
	b	Left: artery (thicker outer wall and thicker layer of muscle and elastic fibre) Right: vein (thinner outer wall and thinner layer of muscle and elastic fibre) Top: outer wall Bottom: muscle and elastic fibre												
	c	Missing words: arteries, veins												
	d	Simple diagram of a valve in a vein preventing backwards flow of blood												
	e	Missing words: oxygen/food, food/oxygen, arteries, thick, veins, valves												
	f	1 Diagram of artery cross section, showing fatty build-up on the inner surface. 2 A blood clot can form on the fatty lump. 3 The blood clot can block the artery. 4 Some of the heart muscle is starved of oxygen and cells start to die.												
10	a	<ul style="list-style-type: none"> usually caused by ...genetic factors usually caused by ...lifestyle factors not normally caused by microorganisms 												
	b	High-fat diet – your blood cholesterol increases High-salt diet – your blood pressure increases Smoking – your blood carries less oxygen Being overweight – your heart has to work harder Drinking too much alcohol – your weight increases and you may be less active Stress – you may eat, smoke, and drink more												
	c	Exercise												
11	a	Cause – there is evidence that a factor produces an outcome Correlation – there is evidence of some link between a factor and an outcome												

Further guidance

	b	Missing words: increases, increases, correlation, cause
	c	<ul style="list-style-type: none"> • Correlation – between amount of fat around the waist and diabetes/heart disease • Cause – chemicals produced by fat cells with can raise blood pressure and increase cholesterol levels in the bloodstream
12	a	<ul style="list-style-type: none"> • Study A, because it used a larger sample of men • If two studies get similar results, the conclusions are more reliable.
	b	Age, gender, lifestyle factors (e.g. smoking, diet and exercise)
	c	<ul style="list-style-type: none"> • The method and results are published in a scientific journal for other scientists to read. • Was the method valid (is it measuring what it meant to measure)? Are there other possible explanations for the results? • If other scientists can replicate the results this means the data is more reliable. • The claims are accepted for the time being. If new data is found which does not agree with the findings, then scientists will look again at the evidence.

B2 Keeping healthy – Higher Workbook answers

1	a	Headings: virus, bacterium, fungus
	b	Missing words: chemicals, reproduce, destroy, acid, microorganisms
	c	Warm, moist, available nutrients
	d	1 hr 20 mins – 16 bacteria 1:40 – 32 2:00 – 64 2:20 – 128 2:40 – 256 3:00 – 512
	e	Missing words: (top left) poisons, toxins; (bottom left) cell; (box) damage, symptoms
2		Missing words: markers, white, antibodies, engulf, digest
3	a	Correctly labelled diagram, with complementary antibodies drawn over the markers at X.
	b	The white blood cell that recognizes the foreign marker must multiply. The white blood cells then have to make enough antibodies to fight the infection.
	c	Missing words: memory, markers, antibodies, microorganisms, immune
4	a	<ul style="list-style-type: none"> For example: White blood cells recognize foreign markers from the microorganism in the vaccine. They produce antibodies against this type of microorganism. The child is now immune to this microorganism. Memory cells that recognize the invading microorganisms are already in the blood. They detect the microorganisms immediately. The correct antibodies are quickly produced. The antibodies destroy the invading microorganisms before they can reproduce and cause illness.
	b	Diagram: antibody for virus B has a V-shaped end, complementary to the black markers on the outside of the virus. <ul style="list-style-type: none"> The antibody produced to fight virus A will not 'fit' the markers on virus B. Other white blood cells will only engulf and destroy the microorganisms that antibodies stick to.
	c	<ul style="list-style-type: none"> The HIV virus damages some immune system cells, so the body cannot respond to other infections as well as normal. A vaccine is made using one type of HIV virus. It causes antibodies to be made which are specific to this type of HIV virus. If the virus changes by mutation, these antibodies will not work against the new virus.
5	a	Rows 1 and 2 of the table
	b	Rows 3 and 4 of the table
	c	<ul style="list-style-type: none"> Who should decide whether or not a child is vaccinated? Student's personal view, with explanation.

Further guidance

	d	<ul style="list-style-type: none"> If fewer children are vaccinated, then large numbers of the disease-causing microorganisms will be left in infected people. There are lots of unvaccinated people who could contract measles. So the chance of a healthy unvaccinated person coming into contact with someone who has measles is much higher than if 95% of the population were vaccinated.
	e	<p>Arguments for:</p> <ul style="list-style-type: none"> if lots of children are not vaccinated, this puts others at risk almost everyone who has the vaccination notices no harmful effects if they do, the effects are usually very mild if they are not vaccinated and get measles, they could be severely disabled measles can be fatal, so vaccination can save lives an outbreak of measles would be costly to the NHS and to society <p>Arguments against:</p> <ul style="list-style-type: none"> a very small number of people do have serious harmful effects from a vaccine parents should be able to decide what is best for their child
	f	In Africa parents are more likely to have seen children seriously ill or dying from measles. They might consider the benefits of not getting measles to outweigh the risks of possible harmful effects from the vaccine.
6	a	Septic wound, athlete's foot, cystitis, tuberculosis
	b	Diagram in 2 – some bacteria drawn in the circle (not as many as in circle 1); missing word: kills Diagram 3 – no bacteria drawn in the circle; missing word: all
7	a	The microorganisms in a population are not all completely identical. There is some variation between the microorganisms caused by mutation.
	b	Diagram 1 – lots of bacteria, as in question 6b diagram 1 Diagram 2 – some bacteria Diagram 3 – lots of bacteria. Explanation: Some of the bacteria are more resistant to the antibiotic. They survive and reproduce.
	c	<ul style="list-style-type: none"> This way you will kill all the bacteria. If you don't, then those bacteria that are more resistant to the antibiotic will survive. The infection may come back. The antibiotics won't work because colds are caused by viruses. Over-use of antibiotics increases the chance of antibiotic-resistant bacteria growing. So in future, the antibiotics would not have an effect.
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	c	Testing on cells is not enough – we need to know if a drug is safe and effective to use on whole organisms. It is safer for humans to find out as much as possible about this by testing on other animals first.												
	d	<Question deleted - will be corrected at reprint>												
	e	Open, blind, double-blind												
	f	<p>Best available treatment – treatment that uses tried and tested existing drugs</p> <p>Control group – the people that are not given the trial drug</p> <p>Placebo – treatment that appears similar but does not contain the drug under test</p> <p>Random groups – groups selected without considering any particular characteristics</p>												
	g	<p>Patients must be offered the best available treatment when it is available. Placebos may be used when there is currently no other treatment for the disease, so patients being given the placebo are not missing out on treatment.</p> <p>(However, if the disease is life-threatening it may be wrong to use placebos, as this denies patients the chance of having a drug which may help them. In some trials where a disease is life-threatening, if the trial produces evidence that the drug is working well, patients who are being given the placebo may be told so they can be offered the new drug.)</p>												
	h	The results are more reliable. Neither doctor nor patient knows who has been given the drug, so this knowledge cannot influence the way they report results.												
	9 a	<p>Left: artery (thicker outer wall and thicker layer of muscle and elastic fibre)</p> <p>Right: vein (thinner outer wall and thinner layer of muscle and elastic fibre)</p> <p>Top: outer wall</p> <p>Bottom: muscle and elastic fibre</p>												
	b	Missing words: oxygen/food, food/oxygen, thick, veins, valves												
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Further guidance

	b	High-fat diet – your blood cholesterol increases High-salt diet – your blood pressure increases Smoking – your blood carries less oxygen Being overweight – your heart has to work harder Drinking too much alcohol – your weight increases and you may be less active Stress – you may eat, smoke, and drink more
	c	Exercise
11	a	Cause – there is evidence that a factor produces an outcome Mechanism – steps that explain how a factor causes an outcome Correlation – there is evidence of some link between a factor and an outcome
	b	The first and third sentences are correct interpretations.
	c	Missing words: increases, increases, correlation, cause
	d	<ul style="list-style-type: none"> • Correlation – between amount of fat around the waist and diabetes/heart disease • Cause – chemicals produced by fat cells with can raise blood pressure and increase cholesterol levels in the bloodstream
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