

B1a answers

Remember:

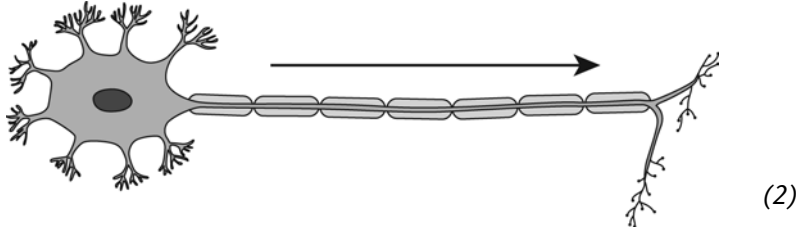
Check which grade you are working at.

Page 4 Coordination

1 a Brain (1); spinal cord (1)

b i Motor (1)

ii



iii Neurones carry information in the form of **electrical** impulses. Sensory neurones carry impulses from **receptors** to the **central** nervous system. (3)

Page 4 Receptors

2

1	2	3	4
D	B	A	C

(4)

3 a

1	2	3	4
D	C	A	B

(4)

b i The heart (1)

ii Adrenaline provides more oxygen to muscles (so you can run faster) (1)

Page 5 Reflex actions

1 a C (1)

b i Transmitter substance / Acetylcholine (1)

ii Transmitter substance (contents of X) is released into the cleft and diffuses across the cleft and sets up impulse in the next neurone (2)

Page 5 In control

2 a A (1)

b 1 from the skin in sweat (1); 2 in urine (1); 3 from the lungs in breath (1)

c To replace (sodium and chloride ions) lost in sweat (1); to maintain their concentration in the blood/so that cells can work effectively (1)

d Makes the liver take glucose from the blood storing it as glycogen (2)

B1a answers

Page 6 Reproductive hormones

- 1 a B (1)
b B (1)

Page 6 Controlling fertility

- 2 a A (1)
b i The older the woman, the lower the success rate (1)
ii The success rate is too low (1); uses up money better spent on other health treatments (1); possible problems for children of (very) elderly parents (1)
- 3 a A (1)
b (Any 2:) Could encourage people to have more sexual partners; could encourage people to have sex more often; could mean people stop using condoms

Page 7 Diet and energy

- 1 a We get our energy from the food that we eat, especially **fats**, carbohydrates and proteins. A **balanced** diet contains the right amount of energy. People who eat a poor diet are said to be **malnourished**. (3)
b i The rate of chemical reactions in cells / the body (1)
ii Katie's metabolic rate is faster (1); so she uses up energy faster (1)
iii Olivia could do more exercise (1)

Page 7 Obesity

- 2 a France (1)
b 28% (1)
c In Russia, there are more obese women than obese men, in Canada, the percentages obese men and obese women are the same (1)
d Obese people put more, stress / weight, on their joints (1); cause damage to the joint surface / wear away cartilage (1)

B1a answers

Page 8 Not enough food

- 1 a** Lack of food reduces resistance to (infectious) diseases
- b i** Energy taken in depends on the total amount eaten / what matters is the balance between energy taken in and energy used / weight is lost only if energy taken in is less than energy used
- ii** (Any 2:) They will not be able to maintain this weight loss; weight will easily go back on again they may feel ill; weak (after losing so much weight so quickly) they may have lost a lot of water

Page 8 Cholesterol and salt

- 2 a** B (1)
- b** The blood carries **cholesterol** in two forms, HDL and LDL. It is better to have **more** HDL than LDL. Eating **monounsaturated** fats can help to reduce blood cholesterol. (3)
- c** (Any 3:) Plaques form; in walls of arteries; from cholesterol; clots can form; heart muscle does not get a good supply of blood; so does not receive enough oxygen; muscle can, stop working / die

Page 9 Drugs

- 1 a**
- | | | | |
|---|---|---|---|
| 1 | 2 | 3 | 4 |
| A | D | C | B |
- (4)

- b** You cannot manage without it (1); if you stop taking the drug you experience withdrawal symptoms (1)

Page 9 Trialling drugs

- 2 a** Tested on animals / human cells (in laboratory) (1)
- b i** A (mean age in years was the same) (1)
- ii** B, C, D and E (1)
- iii** To control a variable (1); every subject took a pill (1); to provide a comparison point with those who took the drug (1)
- iv** Ensures there is only one independent variable (1); removes possibility of observer bias (1)

B1a answers

Page 10 Illegal drugs

- 1 a C (1)
- b i Syringe may be contaminated (1); with viruses (1)
- ii May become addicted (1); suffer withdrawal symptoms if they stop taking it (1)

Page 10 Alcohol

- 2 a Alcohol (1)
- b Alcohol (1)
- c No, we only know how many were admitted to hospital (1); perhaps heroin is more likely to cause hospital admission than cocaine (1)
- d No, we only know how many were admitted to hospital (1); perhaps women take less of the drug than men / are less likely to be made ill by taking the drug (1)
- e Liver cells are damaged as they try to break down alcohol (1)

Page 11 Tobacco

- 1 a
- | | | | |
|---|---|---|---|
| 1 | 2 | 3 | 4 |
| D | A | B | C |
- (4)

- b i 1945 / 1946 (1)
- ii There is a time lag between smoking and getting cancer (1); early increase in deaths from lung cancer may not have been noticed took a while for people to make a link between the two (1)
- iii Some other factor could be causing both increases

Page 11 Pathogens

- 2 a A (1)
- b (Any 2:) He realised that the ward with the most deaths was visited by doctors (1); he suggested they were passing disease-causing substances between patients (1); he asked doctors to wash their hands (before and after touching patients) (1)

Page 12 Body defences

- 1 a White **blood** cells help to defend us against **pathogens**. Some of them **ingest** bacteria and viruses. Others produce chemicals called **antibodies** that destroy particular bacteria and viruses. (4)
- b i Phagocytosis (1)
- ii It is destroyed / killed (1); digested by enzymes (1)

Page 12 Drugs against diseases

- 2 a Antibiotics kill (only) bacteria (1); antibiotics do not kill viruses (1)
- b C (1)

B1a answers

Page 13 Arms race

- 1 Bacteria can become **resistant** to antibiotics by the process of **natural** selection. One example is **MRSA**. We can help to prevent this happening by using **fewer** antibiotics. (4)
- 2 D (1)

Page 13 Vaccination

- 3 a A (1)
- 4 a 9000 (1)
- b No, because we cannot be sure the drop in cases was caused by the vaccination (1) some other factor might have caused them to fall (1); but there is a correlation between the use of the vaccine and the fall in the number of cases (1)
- c Not everyone was vaccinated straight away (1); only 10–14 year olds were vaccinated (1); as time went on a bigger proportion of people had immunity (accept other well-argued suggestions) (1)
- d (Any 4:) Reference to antigens; white blood cells respond; lymphocytes; secrete antibodies; specific to, antigen / TB / bacterium; multiply; form memory cells; on next infection bacteria killed immediately

B1b answers

Remember:

Check which grade you are working at.

Page 15 Hot and Cold

1 a

1	2	3	4
B	D	A	C

(4)

2 a 38 °C (1)

b It loses heat to the cold, air / ground (1)

c The cold blood from the feet is warmed by the warm blood in the artery as it flows upwards (1)

Page 15 Adapt or die

3 Plants and animals are **adapted** for survival in their habitat. Some plants have **poisons** in their leaves, which harm insects that eat the leaves. Some plants have warning colours to deter **predators**. (3)

4 A (1)

Page 16 Two ways to reproduce

1 a In asexual reproduction, the offspring are all **genetically** identical. They are **clones**. In sexual reproduction, the offspring get a mixture of **genes** from both their parents. (3)

b

1	2	3	4
D	A	C	B

(4)

Page 16 Genes and what they do

2 B (1)

3 a Nose shape and hair colour (1)

b Kim could be heavier because she eats more or exercises less / Kim could be better at maths because she works harder at it (1)

c They could have inherited different (combinations of) genes from their parents (2)

Page 17 Cuttings

1 D (1)

2 a (Any 2:) They might have different genes; they might be growing in different kinds of soil; one might have more water than the other; one might have more light than the other

b Acorns are produced by sexual reproduction, so they are genetically different (1); cuttings only have genes from one parent, so they are genetically identical (1)

Page 17 Clones

3 a Fertilisation happens when a **sperm** and an egg fuse together. They form a new cell called a **zygote**. This divides to form a ball of cells. The cells in the ball can be split apart. Each cell grows into an embryo, which can be put into a different **mother**. (3)

b They are all formed from one zygote so they all have the same genes (1); they are genetically identical (1)

B1b answers

Page 18 Genetic engineering

- 1 A (1)
- 2 The bacteria contain the human gene for making insulin (1); the gene carries the code/instructions for making human insulin (1)

Page 18 Theories of evolution

- 3 a D (1)
- b C (1)
- c Only the ones with long necks reproduce (1); they pass on their genes to their offspring; all offspring contain the genes for long necks (1)

Page 19 Natural selection

- 1 Organisms **compete** for survival. Only the best **adapted** ones live long enough to **reproduce**. They pass on their **genes** to their offspring. Over many **generations**, most of the organisms will contain these advantageous genes. (3)
- 2 a D (1)
- b A (1)

Page 19 Fossils and evolution

- 3 a D (1)
- 4 a From fossils (1)
- b (Any 2:) Idea that they were adapted to their environment; more toes better for running on wet ground; climate became dryer; horses with fewer toes more likely to survive; and pass on their genes for fewer toes to their offspring; over time/many generations, all horses had only one toe

Page 20 Extinction

- 1 B (1)
- 2 (Any 2:) Competition with the introduced crayfish / introduction of new competitor; compete for limited resources / not enough food for all; new disease may kill them; not enough new crayfish born to replace the ones that die

Page 20 More people, more problems

- 3 As the human **population** increases, we use more and more non-renewable fuels such as **oil**. We also use more **metals**, which we extract from ores. We cause more **pollution**. (4)
- 4 a The right hand part beyond the current year (1)
- b About 2 billion (1)
- c By about three times (1)

B1b answers

Page 21 Land use

1

1	2	3	4
D	A	C	B

(4)

Page 21 Pollution

- 2 Could catch diseases by taking in viruses / bacteria / pathogens (1); examples – cholera, polio, gastroenteris, Weil’s disease, allergic alveiolitis (1)
- 3 a (Any 2:) Extra nitrate made plants grow more; they shaded out plants beneath them; many plants died; bacteria fed on them (so the bacterial population increased)
- b The bacteria respired (1); aerobically (1)
- 4 a Concentration of DDT increases up the food chain (1); greatest concentration in the animals at the end of the chain (1)
- b (Any 2:) DDT persists for a long time; in the environment / in the bodies of animals; perhaps DDT is still being used in other countries

Page 22 Air pollution

- 1 a B (1)
- b Cause bronchitis / trigger asthma attacks (but not actually cause asthma) (1)

Page 22 What causes acid rain?

- 2 a Carbon dioxide (1)
- b It prevents the blood from carrying oxygen (1)
- c They damage the lungs (1); cause breathing problems / coughing / asthma attacks (1)
- d The gases dissolve in water droplets react to form acids (1); rain droplets containing acid fall to the ground when it rains (1)
- e Kills trees by damaging their leaves / roots (1); washing away nutrients kills fish by making water acidic / toxic chemicals washed in from soil (1)
- f The limestone neutralises the acid by reacting with it (to form salts and water) (1); pH is raised (1)

B1b answers

Page 23 Pollution indicators

- 1 a Chironomid larva (1)
 b The pH is less than 5.4 / about 5.1 (1)
- 2 a (Any 2:) Use the animals as indicators; different animals can live in different oxygen concentrations; find out which animals are living in the water; match them to the oxygen concentration in which they are known to live
 b (Any 2:) Rat-tailed maggots; they can survive in the lowest oxygen concentration; raw sewage reduces the oxygen concentration in the water.

Page 23 Deforestation

- 3 C (1)
 4 A (1)

Page 24 The greenhouse effect – good or bad?

- 1 A (1)
 2 Carbon dioxide traps energy that is **radiated** from the Earth. This stops the energy from escaping into **space**. It keeps the Earth **warmer** than it would otherwise be. (3)
 3 A (1)

Page 24 Sustainability – the way forward?

- 4 a Less electricity / less fuel needed to heat the house (1)
 b i (Any 2:) Making sure we do not use resources faster than they are being replaced; using the environment in such a way that we do not spoil it for the future; improving the quality of people's lives without damaging the chances of our survival in the future
 ii (Any 2:) Less petrol used; so less oil needs to be taken from the ground; less carbon dioxide released to the atmosphere (by the combustion of fuels); so less contribution to global warming