

## Unit 2

Answers	Marks	Examiner's tips
<p>1 (a) more light reaches the ground; more types of plant/producers (<i>reject reference to trees</i>); more habitats/microclimates; more varieties of food/more complex food web; more niches; different nesting sites; dead wood/leaves left to rot providing more nutrients/shelter; greater variety of herbivore/primary consumer/carnivore (<i>ignore reference to animals</i>);</p> <p>(b) reduces (the variety of alleles)/genetic diversity; only certain phenotypes allowed/selected to breed; (phenotypic) character controlled by allele; some/non-selected alleles eliminated/frequency decreased; others/selected alleles increase in frequency (<i>reject reference to genes</i>);</p>	<p>4 max</p> <p>4 max</p>	
<p>2 (a) lower enzyme activity; decrease in rate of photosynthesis; less carbohydrate formed/named carbohydrate; lower respiration; lower rate of nutrient uptake; lower rate of protein synthesis; lower rate of cell division; damage by frost; lower translocation of sucrose/to growing point;</p> <p>(b) (i) differ in height when plants from different altitudes grown in same environment;</p> <p>(ii) plants from 1500 m/ 3000 m differ in height when grown at different altitudes;</p>	<p>4 max</p> <p>2</p>	<p>There may be other correct answers to this but always put the most common answers first even if you have specialised knowledge of a particular effect of temperature.</p> <p>Make sure you answer both parts in terms of factors affecting height, both genetic and environmental.</p>
<p>3 (a) P = phosphate; Q = deoxyribose (<i>allow pentose/5-carbon sugar, reject sugar</i>); R = adenine (<i>reject base</i>); S = nucleotide;</p>	<p>4</p>	<p>You need to know the base pairings adenine–thymine and cytosine–guanine. Do not mix up thymine with thiamine or adenine with adenosine. These are common mistakes.</p>

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(b) DNA polymerase;	1	
(c) interphase/S phase;	1	
4 (a) X between zygote and spores;	1	
(b) independent assortment; crossing over;	2	
(c) some (new phenotypes) may survive adverse conditions; resistant spores produced;	1	
5 (a) 1. water evaporates/transpires from leaves; 2. reduces water potential in cell/water potential/osmotic gradient across cells ( <i>ignore reference to air space</i> ); 3. water is drawn out of xylem; 4. creates tension ( <i>accept negative pressure, not reduced pressure</i> ); 5. cohesive forces between water molecules; 6. water pulled up as a column;	4 max	There are several ways to get marks in this section. It is always worth making a quick list of as many points as you can remember and ticking them off as you do them. This is an easy question if you have learned the sequence.
(b) (i) same surface area of leaf/number of leaves/age/thickness of cuticle;	1	This section tests your understanding of controlling variables and interpreting results. Do as many of this type of question as you can.
(ii) (environmental conditions) affect rate of transpiration/evaporation;	1	
(iii) presence of grease reduces water loss;	1	
(c) (i) 1.2 g;	1	When the upper side is greased then water can only be lost from the lower surface. When both sides are greased 0.1 g is still lost. So the water lost from the upper surface is $10.0 - 0.1 - 8.7 = 1.2$ g Remember to put the units in your answer. There is often a mark for units.
(ii) more stomata on the lower surface; (thicker) waxy cuticle on the upper surface;	2	
6 (a) endodermis; xylem;	2	

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(b) Casparian strip/suberin/impermeable/ barrier to water movement ( <i>idea of waterproof, not waxy</i> ); water enters cell along water potential/ osmotic gradient/by osmosis;	<b>2</b>	Make sure that you use the correct scientific names for all the parts. If you have not used scientific terms in your answer you are probably not answering to AS level standard.
7 (a) large numbers/network, so large surface area for diffusion/gas exchange; thin walls/one cell thick, so short diffusion distance ( <i>not just 'thin', or 'thin membrane'</i> ); flattened cells in walls, so short diffusion distance; narrow lumen, so red cells touch walls/pass singly; walls/membranes permeable/porous to gases, for diffusion ( <i>not 'lots of pores'</i> );	<b>4 max</b>	The question asks you to explain so you must put an adaptation <b>and</b> an explanation for 1 mark. Do not put just 'thin', which is not precise, or 'thin membrane' which is incorrect.
(b) 1. diffusion of oxygen into red cell/ haemoglobin in red cells; 2. high affinity of haemoglobin in high oxygen concentration; 3. (therefore) loads/becomes saturated in lungs/where oxygen abundant; 4. oxyhaemoglobin formed; 5. reference to role of haem, e.g. energy changes/role $\text{Fe}^{2+}$ ions/haemoglobin molecule combines with fewer oxygen molecules; 6. unloads/low affinity in low concentration; 7. explanation in terms of dissociation curve, i.e. small changes in concentration gives large changes in saturation; 8. respiration in tissues gives high $\text{CO}_2$ concentration/high temperature/high $\text{H}^+$ concentration/low pH; 9. dissociation curve shifts to right/ oxyhaemoglobin dissociation at higher partial pressure;	<b>6 max</b>	This is not a difficult question if you have learned the facts. You must do a brief plan for this question so you do not miss any of your points or repeat ones you have already done. These are the questions that really boost up your marks so are worth a bit of preparation. Make sure you answer in sentences and that the points are in a sensible order.

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<p>8 (a) any 3 from – heterotrophic; no cell walls; blastula formation; (chemical and) nervous control; growth not confined to meristems; starch in plants; (accept have muscles);</p>	<b>3 max</b>	<p>This is asking you for the differences between animals and plants but your answer must be in terms of AS level knowledge. Make it clear whether your answer is referring to animals or plants. Do not just put 'It . . .'</p>
<p>(b) Phylum, Class, Order, Family; <i>Ensatina eschscholtzi</i>;</p>	<b>2</b>	<p>Remember to underline (or write in italics) Latin names of organisms.</p>
<p>(c) (i) breed together salamanders from different areas; if offspring are fertile, then still same species;</p>	<b>2</b>	
<p>(ii) phenotype depends on genotype and environment; different local environments can produce variation; different selection pressures; mutations producing new alleles; meiosis produces new combinations of alleles/example; random fusion of gametes/sexual reproduction;</p>	<b>4 max</b>	<p>It is always worth writing a quick list to make sure you put down all the points. Write your answer in full sentences using your list to help. Do not use bullet points.</p>
<p>9 (a) antibiotic has diffused/spread/moved into agar; killed/inhibited bacteria;</p>	<b>2</b>	
<p>(b) largest clear area/inhibition zone/killed the most bacteria;</p>	<b>1</b>	
<p>10 1. frequent use of antibiotic creates selection pressure/antibiotic kills bacteria; 2. bacteria with mutation/resistance have (selective) advantage over others/described; 3. (survive to) reproduce more than other types; 4. pass on advantageous allele/mutated allele in greater numbers; 5. frequency of (advantageous) allele increases in subsequent generations; 6. frequency of resistant types increases in subsequent generations;</p>	<b>5 max</b>	<p>These longer answers are the ones that can really boost up your marks but it is easy to miss out points that you know and repeat the same point twice. Spend a little time making a quick list and then use it to write out your answer in full sentences in a logical sequence. This is your chance to show that you can communicate your ideas in a logical sequence using scientific terms, e.g. alleles not genes.</p>