**Photosynthesis**
- Explain how the plant leaf is adapted to carry out photosynthesis
- Explain the process of oxidation and reduction
- Explain how ATP is made during the light-dependent reaction
- Explain how chloroplasts are adapted to carry out the light-dependent reaction
- Explain how carbon dioxide absorbed by plants is incorporated into organic molecules
- Describe the roles of ATP and reduced NADP in the light-independent reaction
- Describe the events in the Calvin cycle

**Respiration**
- Outline where glycolysis fits into the overall process of respiration
- Describe the main stages of glycolysis and its products
- Outline the nature of the link reaction
- Explain what happens during the Krebs cycle
- Describe the nature of hydrogen carrier molecules and explain their role in the Krebs cycle
- Describe where oxidative phosphorylation takes place
- Explain how ATP is synthesised during oxidative phosphorylation
- Explain the role of oxygen in aerobic respiration
- Explain how energy is released by respiration in the absence of oxygen
- Explain how lactate is produced by anaerobic respiration

**Energy and Ecosystems**
- Explain how energy enters an ecosystem
- Explain how energy is transferred between the organisms in the ecosystem
- Define the terms: trophic level, food chain, food web, producer, consumer and decomposer
- Define biomass and explain how it is measured
- Calculate the percentage of energy that is transferred from one trophic level to the next
- Explain what is meant by gross primary productivity and net primary productivity
- Summarise the common features of all nutrient cycles
- Describe the features of the phosphorus cycle
- Describe the features of the nitrogen cycle
- Define the terms ammonification, nitrification, nitrogen fixation and denitrification
- Explain the roles of saprobiotic organisms in nutrient recycling
- Distinguish between natural and artificial fertilisers
- Explain how fertilisers increase productivity
- Describe the main environmental effects of using nitrogen-containing fertilisers
- State the meanings of leaching and eutrophication
- Explain how leaching and eutrophication affect the environment
### PiXL 6:

**Subject:** Biology  
**Examination Board:** AQA  
**Specification Code:** 7402

### Section: 6 Organisms respond to changes in their environment

<table>
<thead>
<tr>
<th>Response to stimuli</th>
<th>Secure at Target</th>
<th>Insecure at Target</th>
<th>Grade</th>
<th>No Knowledge at Target Grade</th>
<th>Students’ Target ALPS + 1 Fine Levelled Grades</th>
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<tbody>
<tr>
<td>Define a stimulus and a response</td>
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<td>Examine the advantage to organisms of being able to respond to a stimulus</td>
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<td>Describe taxa, kineses and tropisms</td>
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<td>Explain how each type of response increases an organism’s chances of survival</td>
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<td>Describe the stimuli that plants respond to</td>
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<td>Describe plant growth factors such as IAA</td>
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<td>Explain phototropism in flowering plants</td>
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<td>Explain gravitropism in flowering plants</td>
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<td>Explain how a simple reflex arc works</td>
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<td>Explain the roles sensory, intermediate and motor neurones play in a reflex arc</td>
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<td>Outline the importance of reflex arcs</td>
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<td>Describe the main features of a sensory receptor</td>
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<td>Describe the structure of a Pacinian corpuscle and explain how it works</td>
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<td>Explain how receptors work together in the eye</td>
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<td>Describe the autonomic nervous system</td>
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<td>Explain how the autonomic nervous system controls heart rate</td>
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<td>Explain the role chemical and pressure receptors play in the processes controlling the heart rate</td>
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<td><strong>Nervous coordination and muscles</strong></td>
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<td>Distinguish between nervous and hormonal coordination</td>
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<td>Describe the structure of a myelinated motor neurone</td>
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<td>Describe the different types of neurone</td>
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<td>Describe the nature of the resting potential</td>
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<td>Explain how the resting potential is established in a neurone</td>
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<td>Explain what an action potential is</td>
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<td>Explain how an action potential passes along an unmyelinated axon</td>
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<td>Describe the factors that affect the speed of conductance of an action potential</td>
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<td>Explain what is meant by the refractory period</td>
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<td>Explain the role of the refractory period in separating one impulse from the next</td>
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<td>Explain the meaning of the all-or-nothing principle</td>
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<td>Describe the structure of a synapse</td>
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<td>Describe the functions that a synapse performs</td>
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<td>Explain how information is transmitted across a synapse</td>
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<td>Describe the gross and microscopic structure of skeletal muscle</td>
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<td>Describe the ultrastructure of a myofibril</td>
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<td>Explain how actin and myosin are arranged within a myofibril</td>
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<td>Describe the nature of actin and myosin</td>
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<td>Explain what is meant by antagonistic muscles and how they operate</td>
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<td>Summarise the evidence that supports the sliding filament mechanisms of muscle contraction</td>
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<td>Explain how the sliding filament mechanism causes a muscle to contract and relax</td>
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<td>State where the energy for muscle contraction comes from</td>
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<td><strong>Homeostasis</strong></td>
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<td>Describe the nature of homeostasis</td>
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**PiXL 6:**

**Subject: Biology**

**Examination Board: AQA**

**Specification Code: 7402**

**Section: 7 Genetics, populations, evolution and ecosystems**

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**Inherited change**

- Define the meaning of the terms genotype and phenotype
- Define the nature of multiple alleles
- Explain how to make labelled genetic diagrams
- Explain why results of genetic crosses often differ from predicted results
- Explain the nature of multiple alleles
- Explain how codominance affects the inheritance of characteristics
- Explain how multiple alleles affect inheritance
- Explain how blood groups are inherited
- Explain how sex is determined genetically
- State what is meant by sex-linkage
- Explain how autosomal linkage affects the combinations of alleles in gametes
- Explain what is meant by epistasis
- Explain what the chi-squared test is
- Calculate values for chi-squared
- Demonstrate how the chi-squared test is used in genetics

**Populations and evolution**

- Define the terms gene pool and allelic frequency
- Define the Hardy-Weinberg principle
- Using the Hardy-Weinberg principle calculate allele, genotype and phenotype frequencies
- Describe variation due to genetic factors
- Describe variation due to environmental influences
- Define a gene pool
- Explain the role of overproduction of offspring in natural selection
- Explain the role of variation in natural selection
- Describe stabilising selection
- Describe directional selection
- Describe disruptive selection
- Explain the effects of each form of selection on evolution
- Explain how new species are formed
- Explain how populations can become geographically isolated
- Describe allopatric and sympatric speciation

**Populations in ecosystems**

- Define the terms environment, biotic, abiotic and biosphere
- Explain what is meant by an ecosystem
- Explain what is meant by the terms population, community and habitat
- Explain what a niche is
### PiXL 6:

**Subject:** Biology  
**Examination Board:** AQA  
**Specification Code:** 7402  
**Section:** 9 Skills in A level Biology

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**Students' Target ALPS + 1 Fine Levelled Grades**

### Mathematical skills

- I know when I am using the correct units
- I understand how to use and convert to standard form
- I can convert to significant figures
- I can calculate a mean
- I can work out the median
- I can work out the mode
- I can calculate percentages
- I can substitute into equations
- I can rearrange equations
- I can estimate results
- I can calculate standard deviations
- I can calculate percentage error
- I know when to use a certain type of graph
- I know how to draw graphs correctly
- I can add error bars to plotted points
- I can calculate rates from a graph
- I can interpret scatter diagrams
- I can calculate probability
- I am confident I can chose the correct statistical test for my data
- I can calculate the circumference of a circle
- I can calculate the surface area of a sphere, a cylinder, a cube
- I can calculate the volume of a sphere, cylinder and a cube
- I can calculate pH
- I can calculate magnification
- I can calculate pulmonary ventilation rate
- I can calculate cardiac output
- I can calculate the efficiency of energy transfer
- I can calculate Net Primary Production (NPP)
- I can calculate Net production by consumers, N
- I can use the chi squared test
- I can use the t test
- I can calculate variance
- I can calculate the correlation coefficient
- I can use the Hardy-Weinberg formula

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**Date you have reviewed**

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