

# GCSE Biology (Separate Science)

## Success Criteria: Nervous system



<i>I can...</i>	
<b>Describe</b> the function of the nervous system (how the body communicates with itself and also receives information from its surroundings.)	
<b>State</b> that sense organs contain receptor cells to detect specific stimuli (changes in the environment)	
<b>Describe</b> how upon detecting a stimulus receptor cells generate an electrical signal that can be transmitted along nerve cells (neurones)	
<b>Identify</b> the brain and spinal cord as the central nervous system CNS [also called coordinators]. CNS contains relay neurons.	
<b>State</b> that sensory neurones transmit impulses TO the CNS, motor neurones transmit impulses FROM the CNS.	
<b>Describe</b> the basic pathway of a nervous impulse [receptor -> coordinator -> effector}	
<b>State</b> that effectors carry out the response. They are either muscles (contracting to cause movement) or glands (that secrete chemicals/hormone)	
<b>Explain</b> the purpose of reflex actions (rapid response to evade danger.)	
<b>Describe</b> the pathway of a reflex arc. Only 3 neurones involved. Uses closest coordinator (not necessarily the brain, and never the conscious part of the brain) for fastest response. [receptor>sensory neurone>relay neurone>motor neurone>effector]	
<b>State</b> that a synapse is a physical gap between two neurones.	
<b>Describe</b> how the electrical impulse is converted to a chemical (neurotransmitter) to be transmitted across the synapse. Neurotransmitter diffuses across the synapse and is detected by the next neurone generating a new electrical impulse.	
<b>Practical skills: REACTION TIMES.</b> Plan and carry out an investigation into the effect of a factor on human reaction time.	

# Brain and Eye (Separate Sciences ONLY)

<i>I can...</i>	
<b>Identify</b> the brain as part of the central nervous system and state that the brain contains billions of interconnected (relay) neurones.	
<b>Describe</b> the structure and function of the brain (including cerebrum, cerebellum, medulla, hypothalamus, pituitary) including identifying where each region is located on a diagram.	
<b>Explain</b> some of the difficulties of investigating brain function (including the difficulty in getting research subjects and the consideration of ethical issues)	
<b>Explain</b> some of the limitations in treating damage and disease in the brain and other parts of the nervous system (including the limited ability to repair nervous tissue, irreversible damage to the surrounding tissues and difficulties with accessing parts of the nervous system)	
<b>Evaluate</b> the benefits and risks of procedures carried out on the brain and nervous system.	
<b>Explain</b> how the main structures of the eye are related to their functions (including cornea, iris, pupil, sclera, lens, retina, optic nerve, ciliary body, suspensory ligaments)	
<b>Describe</b> how the iris muscles change the size of the pupil to adapt to different light intensities Dim light require large pupil (circular muscles relax, radial muscles contract) Bright light requires small pupil (radial muscles relax, circular muscles contract)	
<b>Describe</b> the process of accommodation of the eye (changing the shape/thickness of the lens to focus on near or distant images) To focus on a near object: <ul style="list-style-type: none"> <li>• the ciliary muscles contract</li> <li>• the suspensory ligaments loosen</li> <li>• the lens is then thicker and refracts light rays strongly.</li> </ul> To focus on a distant object: <ul style="list-style-type: none"> <li>• the ciliary muscles relax</li> <li>• the suspensory ligaments are pulled tight</li> <li>• the lens is then pulled thin and only slightly refracts light rays</li> </ul>	
<b>Describe</b> two common defects of the eyes are myopia (short sightedness= image <i>falls short</i> of retina) and hyperopia (long sightedness = image <i>goes long</i> of retina) in which rays of light do not focus on the retina.	
<b>Explain</b> how these problems may be overcome using lenses (glasses or contact) concave = diverge (bend outwards) Convex = converge (bend inwards)	

## Additional support:



Access the GCSE Biology digital textbook by logging on to [www.kerboodle.com](http://www.kerboodle.com) (*you have your own login details...ask any science teacher if you are unsure*). Read the relevant pages (see below).

### AQA exam specification:

#### *The human nervous system*

- 4.5.2.1- Structure and function
- 4.5.2.2 The brain
- 4.5.2.3 The eye

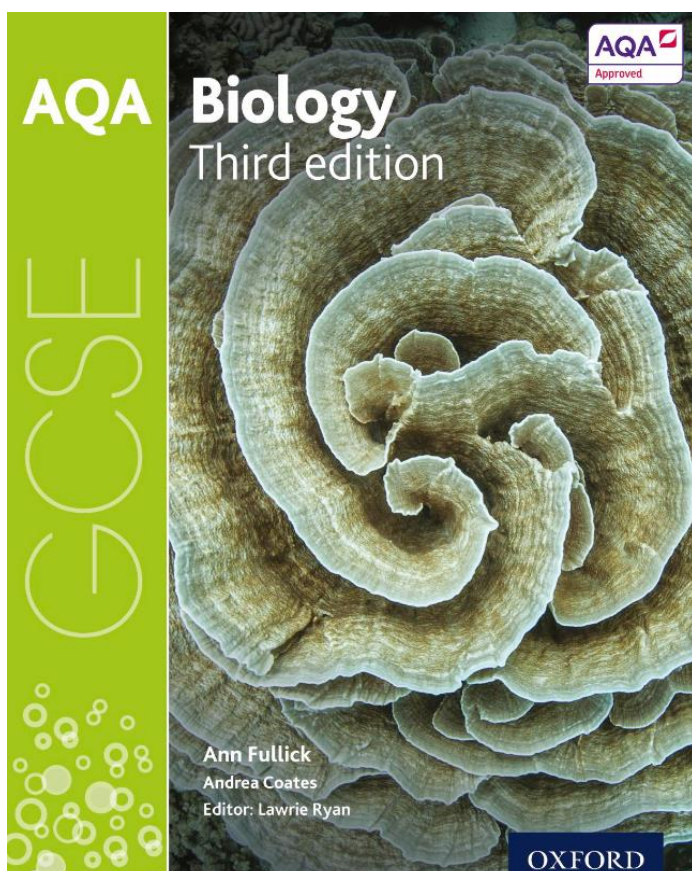
Separate Biology GCSE textbook

### **Nervous system**

pages 144-152

### **Brain and Eye**

Pages 152-158



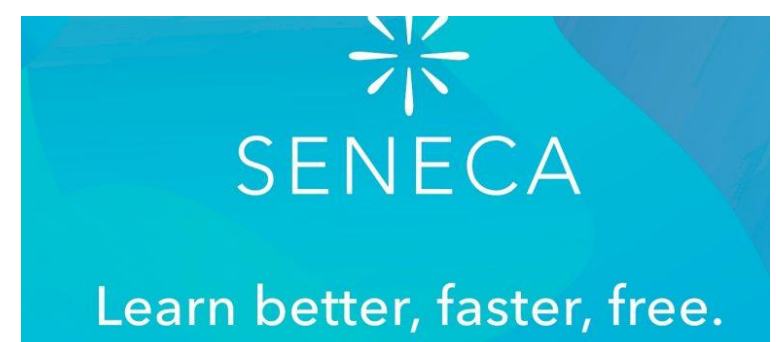
**Write your own summary notes** (bullet points of the key ideas /keywords list with definitions/ annotated diagrams/ mind-maps or flash cards) to go over the main content of the topic.

Attempt the textbook summary questions.



[www.BBCbitesize.com](http://www.BBCbitesize.com) has some great AQA GCSE revision resources too.

[www.Senecalearning.com](http://www.Senecalearning.com) is a free online revision platform that is great for reviewing content too.



[www.physicsandmathstutor.com](http://www.physicsandmathstutor.com) has lots of practice exam style questions and mark schemes, grouped by topic, that you should try once you have revised the content.

## Extension work/extra challenge:

Ask your teacher for extension task...

**Pack 2 Topic 1-** Alzheimer's Disease

**Pack 2 Topic 2-** Seeing the Bigger Picture

**Pack 2 Topic 1-** Sights for Sore Eyes