<table>
<thead>
<tr>
<th>Topic</th>
<th>Learning Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topic 1 – Cells and control</td>
<td></td>
</tr>
<tr>
<td>Topic 2 – Cells and control</td>
<td></td>
</tr>
<tr>
<td>Topic 3 – Genetics</td>
<td></td>
</tr>
<tr>
<td>Topic 4 – Natural selection and</td>
<td></td>
</tr>
<tr>
<td>Topic 5 – Health, disease and the</td>
<td></td>
</tr>
<tr>
<td>Topic 6 – Plant structures and their</td>
<td></td>
</tr>
<tr>
<td>Topic 7 – Animal coordination,</td>
<td></td>
</tr>
<tr>
<td>Topic 8 – Exchange and transport in</td>
<td></td>
</tr>
<tr>
<td>Topic 9 – Ecosystems and material</td>
<td></td>
</tr>
</tbody>
</table>

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### Edexcel - GCSE Biology - 2016

**Nervous System Controls & Responds to Study Functions & Directs Behavior**

- Brain is the body's most complex organ.
- Neurons communicate using electrical and chemical signals.
- Genetically determined circuits are the foundation of the nervous system.
- Life experiences change the nervous system.
- Intelligence arises as an interaction between the nervous system and the environment.
- The brain reasons, plans, solves problems.
- The brain endows us with a natural curiosity to understand how the world works.
- The brain makes it possible to communicate, learn and remember.
- Understanding for Therapies: Research Leads to Essential discoveries promote healthy living and sustainable futures.

### Nervous System Structure & Function Are Determined By Bodily Structures & Environment Throughout Life

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### The Body is the Foundation of the Mind

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There are a hundred billion neurons in the human brain, all of which are in use.

Proper nervous system function involves coordinated action of neurons in many brain regions.

The nervous system influences and is influenced by all other body systems (e.g., cardiovascular, endocrine, gastrointestinal, and immune systems).

Neurons have a complex nervous system that works from the simplest to the most complex.

Some neurons continue to be generated throughout life and their production is regulated by hormones and experience.

Electrical signals in muscles cause contraction and movement.

Communication between neurons is strengthened or weakened by an individual’s activities, such as exercise, stress, and drug use.

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Neuronal death is a natural part of development and aging.

Proper nervous system function involves coordinated action of neurons in many brain regions.

The brain is organized to recognize sensations, initiate behaviors, and store and access memories that can last a lifetime.

Continuously challenging the brain with physical and mental activity helps maintain its structure and function - “use it or lose it.”

Simple and complex interactions among neurons take place on time scales ranging from milliseconds to months.

This complex organ can malfunction in many ways, leading to disorders that have an enormous social and economic impact.

The nervous system isStudies on animals play a central role in providing insights into the human brain and in helping to make healthy lifestyle choices, prevent disease, and find cures for disorders.

Research on humans is an essential final step before new treatments are introduced to prevent or cure disorders.

Neuronal death is a natural part of development and aging.

The brain is organized to recognize sensations, initiate behaviors, and store and access memories that can last a lifetime.

The brain learns from experiences and makes predictions about best actions in response to present and future challenges.

Some neurons continue to be generated throughout life and their production is regulated by hormones and experience.

The brain is the body’s most complex organ.

Neurons communicate using electrical and chemical signals.

Neuronal circuits are formed by genetic programs during embryonic development and modified through interactions with the internal and external environment.

Genetically determined circuits are foundation of the nervous system.

Life experiences change the nervous system.

The brain is the foundation of the mind.

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Research leads to essential understanding for therapies.

The human brain endows us with a natural curiosity to understand how the world works.

The nervous system can be studied at many levels, from complex behaviors such as speech or learning, to the interactions among genetic and molecular.

The brain makes it possible to communicate knowledge through language.

Communication can create and solve many of the most pressing problems humankind faces.

The brain is the body’s most complex organ.

Sensory stimuli are converted to electrical signals.

Sensory circuits (sight, touch, hearing, smell, taste) bring information to the nervous system, whereas motor circuits send information to muscles and glands.

The simplest circuit is a reflex, in which sensory stimulus directly triggers an immediate motor response.

Reflexes are based on value judgments made by our brains and are manifested by feelings as basic as love and anger and as complex as empathy and hate.

Differences in genes and environments make the brain of each animal unique.

Life experiences change the nervous system.

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