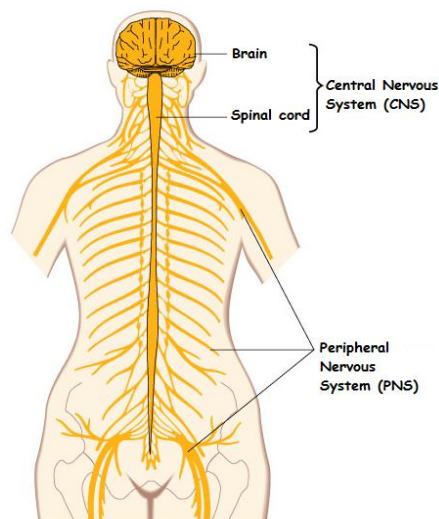


The Nervous System

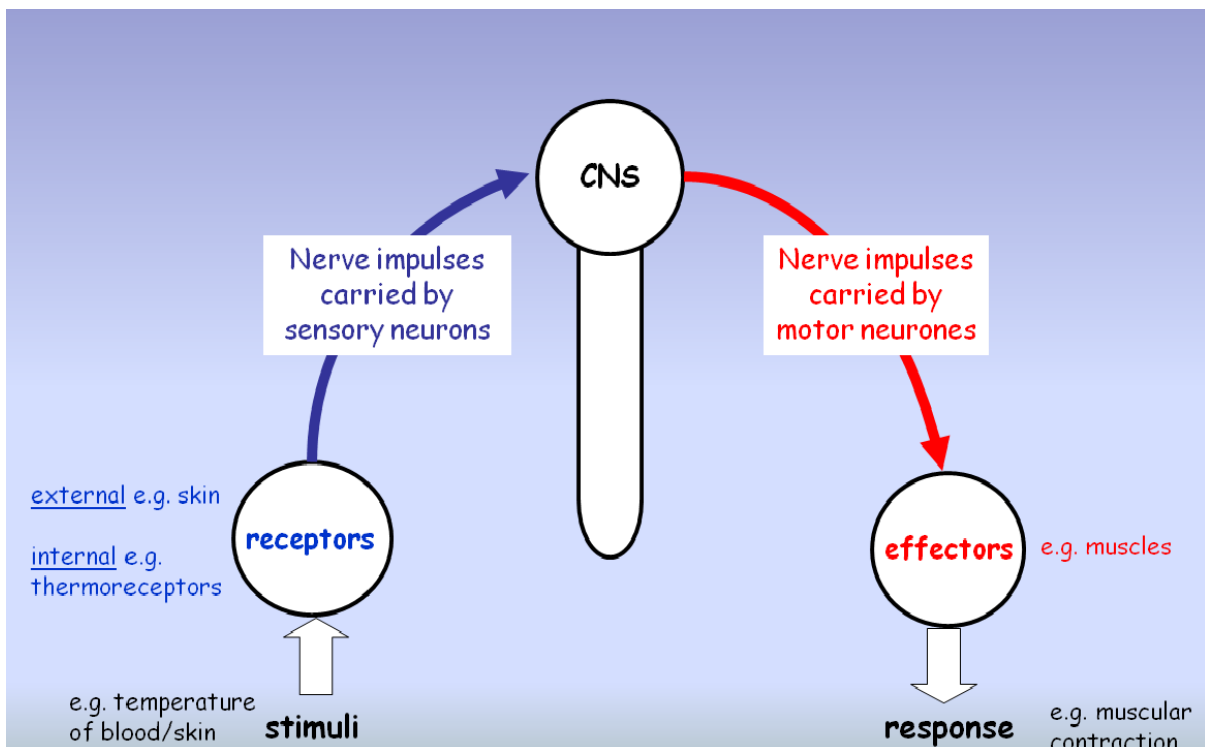
- The nervous system of the human body is responsible for numerous functions, such as:
 - analysing sensory information from the body and external environment
 - storing some information
 - making decisions regarding appropriate responses and behaviours.
- It produces motor responses by causing muscular contractions or secretion from glands.
- The nervous system can be divided into the Central Nervous System (CNS) and the Peripheral Nervous System (PNS).
- The CNS is made of the brain and spinal cord.
- The PNS is made up of neurons throughout the rest of the body.



The Peripheral Nervous System (PNS)

- The PNS is comprised of sensory and motor neuron pathways which pass information to and from the CNS via electrical impulses.
- When a stimulus is detected by receptors in external sensory organs (e.g. eyes, ears etc) or internally (e.g. thermoreceptors in the hypothalamus), an impulse is carried along sensory neurons to the CNS.

- The CNS processes the information and impulses are transmitted along motor neurons to effectors, such as muscles and endocrine glands, which bring about a response, such as muscle contraction or hormone secretion.



- The PNS can be divided into the Somatic Nervous System (SNS) and the Autonomic Nervous System (ANS).

The Somatic Nervous System (SNS)

- The somatic nervous system controls the skeletal muscles through the action of sensory and motor neurons and is involved in mostly voluntary actions, such as walking and speaking.
- The SNS is also responsible for involuntary reflex actions.

The Autonomic Nervous System (ANS)

- The autonomic nervous system (ANS) is responsible for regulating internal structures such as the heart, blood vessels etc.

- This regulation occurs through automatic, involuntary actions which involve sensory and motor neurones.
- The autonomic nervous system is involved in homeostatic control (e.g. regulation of body temperature or osmoregulation).
- The nerves of the ANS arise in the brain and emerge from the spinal cord at numerous points to reach the organs that they stimulate.
- The ANS is made up of two parts, the sympathetic and the parasympathetic systems.

The parasympathetic system

- in control in times of rest and relaxation; slows functions and conserves resources
- acts on heart to lower heart rate
- slows breathing rate
- decreases blood flow to muscles
- increases blood flow to digestive system (increases digestion)

The sympathetic system

- in control when the body is active or excited; raises activity levels
- acts on heart to increase heart rate
- increases breathing rate
- increases blood flow to muscles
- decreases blood flow to digestive system (slows digestion)
- increases perspiration (i.e. sweating)

The sympathetic and parasympathetic systems act on many areas of the body.

- The sympathetic system is involved in the 'fight or flight' response, whilst the parasympathetic system is involved in the 'rest and digest' response.
- As these systems work on the same structures but have opposite effects, they are said to have an antagonistic relationship.

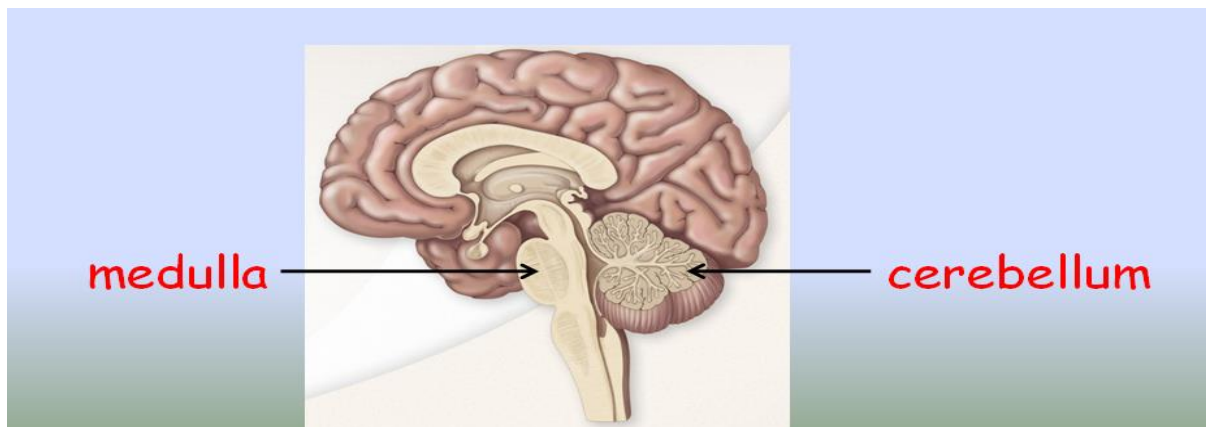
Parts of the Brain

The Brain

- The brain is composed of three interconnected layers:
 - the central core
 - the limbic system
 - the cerebral cortex

The Central Core

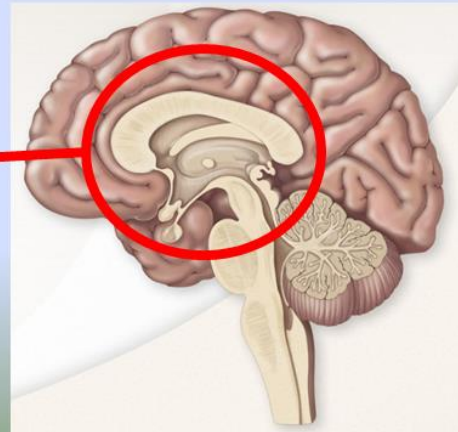
- The central core contains:
 - The medulla – which regulates basic life processes such as breathing, heart rate, sleeping and arousal (being awake and aware of the environment)
 - the cerebellum – which is responsible for controlling balance, posture and movement



The Limbic System

- The limbic system is responsible for:
 - processing information for memories
 - regulating emotional states, e.g. fear, aggression and anxiety
 - Regulating biological motivation, e.g. hunger, thirst and sex drive.

limbic system



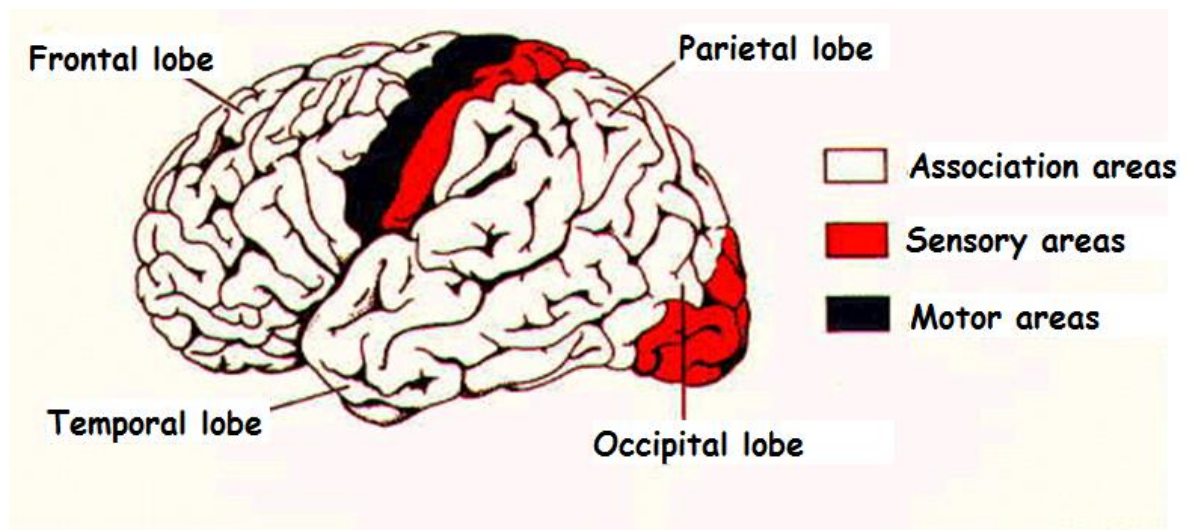
The Cerebral Cortex

- The cerebral cortex is the outer part of the cerebrum and is the centre of conscious thought and memories.
- The cerebral cortex has three key functions
 - receives sensory information
 - co-ordinates voluntary movement
 - making decisions based on experience.
- The cerebral cortex is highly folded (convoluted) which greatly increases its surface area, this
 - provides greater space for more neurons
 - allows for more interconnections between neurons

The Cerebral Cortex – Localisation of function

- Within the cerebral cortex, there are three main areas each of which deals with a particular function.
 - the sensory areas – receives information as sensory impulses from receptors (e.g. sense organs)
 - the association areas - analyse and interpret impulses received from the sensory areas and deals with thought processes, language, personality, imagination and intelligence.
 - the motor areas – act on information from association areas by sending motor impulses to effectors.

- By this means, coordination of voluntary movement is achieved.



Electroencephalograms – EEG's

- EEG's record the electrical activity of the cerebrum.
- EEG's can indicate different levels of brain activity but are not precise enough to locate the areas of the brain which are active.

Brain Scans

- Brain scans, such as CAT, MRI or PET scans, provide a more detailed images of the brain.
- They can detect activity through changes in blood flow or uptake of glucose and can allow localisation of function to be identified by showing which areas are most active whilst carrying out a particular function.

The Cerebrum

- The cerebrum is divided into two halves, the left and right cerebral hemispheres.
- The left cerebral hemisphere receives information from the right visual field and controls the right side of the body.
- The right cerebral hemisphere receives information from the left visual field and controls the left side of the body.

The Corpus Callosum

- The cerebral hemispheres are not entirely separate, they are connected by a bundle of nerve fibres known as the corpus callosum.

- The corpus callosum allows the transfer of information between the cerebral hemispheres and so allows the coordination of brain function, thus enabling the brain to act as an integrated whole.

Split Brain Syndrome

- In rare cases, a person can be born without a corpus callosum or may have it cut due to serious epilepsy, this results in split brain syndrome.
- The cerebral hemispheres do not share information and each processes information separately.

Perception

- Perception is the process by which the brain analyses and makes sense of incoming sensory information.
- A person's perception of their environment can depend on information from many sense organs, although only visual perception will be studied.
- There are three areas of perception:
 - segregation of objects
 - perception of distance

- recognition

1. Perception – segregation of objects

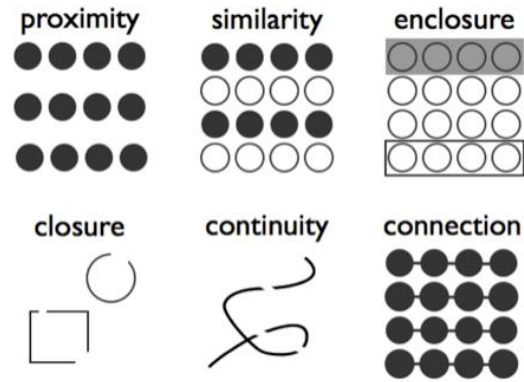
- The ‘figure-ground’ phenomenon allows objects to be distinguished from their background.
- For example, we can see words on printed paper as the ‘figure’ and the paper as the ‘ground’.



- The ‘figure-ground’ perceptual organisation is often used in advertising.
- When perceiving an object, the brain will typically organise visual stimuli into a coherent pattern rather than into separate parts.
- For example, the image below shows 7 lines but the brain tends to perceive this as three groups of 2 lines (plus an extra line).



The brain can organise objects in a number of ways



2. Perception of distance

- The distance of objects from the eye can be determined using visual cues, such as:
 - relative size
 - superimposition
 - relative height

A. Relative height

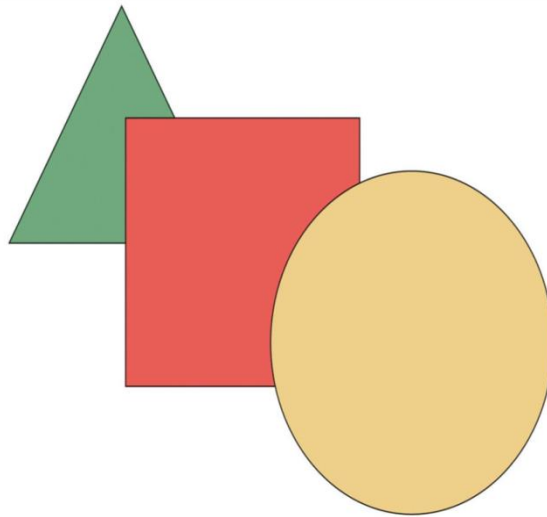
- Objects which are further away from the eye are perceived to be smaller in size.



As the road appears to reduce in size, this indicates its increasing distance from the eye.

B. Superimposition

- When an object partially blocks the view of another, it is perceived to be closer to the eye than the object which is blocked.



C. Relative height

Due to superimposition, the circle is perceived to be the closest object.

- When the base of an object in the field of view appears higher than the base of another, it is perceived to be further away.



In this image, the base of clear nail varnish is lower than that of the red and so appears closer to the eye.

Note: this also displays the effect of relative size.

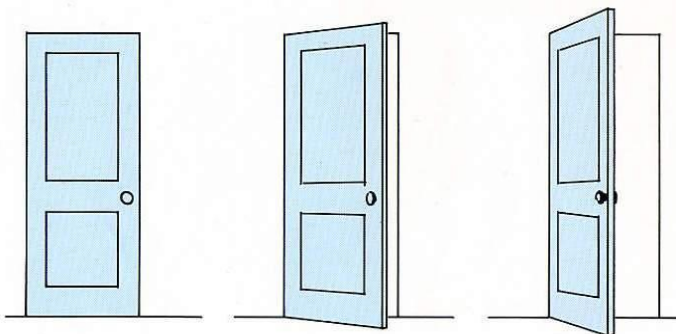
Binocular disparity

- Each eye looks at an object from a slightly different position relative to the other eye.
- Due to this, there is a slight disparity (or difference) between the image each eye forms.

- The closer the object is, the greater the disparity between the two images.
- The two images are merged into one in the brain and produce a binocular image which allows us to better judge depth and distance.

Perceptual constancy

- The size of the image an object makes on our retinas will change as it moves closer or further away.
- We do not perceive the object as increasing or decreasing in size although it may become closer or the angle at which we view it may change, the object has size constancy.
- Our perception of the size of an object as being constant is partly due to past experience and stored knowledge, as we remember **the size of familiar objects**.
- Perceptual constancy also applies to the **shape of objects**.
- We still perceive an objects shape as constant even when the angle at which we view it changes.
- For example, the shape of the door below appears to change but we are aware that its shape is actually constant.



3. Recognition

- Object recognition is the ability to perceive an objects physical properties, such as shape, colour and texture.

- The shape of an object, particularly its outline, is more important than colour or texture when recognising an object.
- During early learning, we use view and touch an object to establish its shape and use this to initially distinguish objects; this information is then stored in our long-term memory.
- When we perceive a shape, our brain subconsciously attempts to match it with a shape description which is already stored in the brain. If the shape is familiar, it is matched to a memory and the object is recognised.
- If the shape is not matched then the brain can match it to previously experienced objects which may have a similar shape and infer that the objects are related in some way.

Recognition – perceptual set

- The tendency of a person to perceive certain aspects of available sensory information and ignore others is known as perceptual set.
- This is influenced by expectation, context or past experience.

Expectation and context

- When the following diagram is covered up in different ways it affects the way we perceive it. This is due to the context in which we are exposed to it and what we expect to see.



Past experience

- Expectations are typically linked to past experience.

- The example below contains a writing error which most people typically overlook due to expectation and past experience.



- If a group is shown pictures of mammals, some which include rodents, they will see a rat in the ambiguous image below.
- If shown pictures of men, some which include bald men with glasses, they will see a man in the image.



cy of a person to perceive information and ignore others is known as perceptual set.

- This is influenced by expectation, context or past experience.

Memory

- Memory is the capacity of the brain to store information, retain it and retrieve it as and when required.
- Memories include past experiences, knowledge and thoughts.
- All information which enters the brain passes through sensory memory and enters the short term memory.
- Information can then be transferred to the long term memory (LTM) or is discarded.

1. Sensory memory

- Sensory memory retains all visual and auditory input but for a very short period of time, only 1 or 2 seconds.

2. Short term memory (STM)

- Short term memory (STM) has a limited storage capacity or 'memory span' holding about seven items of information for roughly 30 seconds.
- The information in the STM must be passed to the long term memory or it will be lost by:
 - displacement – the pushing out of 'old' information by new information
 - decay – the breakdown of the 'memory trace'

A. Rehearsal

- Items can be maintained within the short term memory for longer periods of time through rehearsal.
- Rehearsal involves repeating a piece of information many times, either silently or aloud.
- This also helps to transfer this information to the long term memory (LTM).

B. Chunking

- 'Chunking' is the term given to the organisation of many pieces of information into smaller chunks of information.
- *e.g. the area code for Glasgow is 0141. Individually, this can be thought of as four pieces of information but chunking allows us reduce this to one piece of information.*
- Grouping many pieces of information into smaller chunks allows us to improve our short term memory span.

C. Serial position effect

- When information is viewed in a sequence, the first and last few pieces of information are remembered best. This memory pattern is known as the serial position effect.
- The first few pieces of information are remembered as there has been enough time for rehearsal, and the information has been transferred to long term memory.
- The middle pieces of information are quickly forgotten because the short term memory is crowded with information.
- The last pieces of information are remembered because they have not yet been displaced from the STM.
- Advertisers pay more for the first and last advert slots to take advantage of the serial position effect.

D. Working memory

- Working memory is an extension of the STM.
- It allows us to actively process information while it is held in the STM and allows us to carry out simple cognitive tasks, such as counting.
- e.g. allows you to picture your home and count the number of doors within.

3. Long term memory (LTM)

- The long term memory is thought to be able to hold an unlimited amount of information.
- In order for information to be transferred from the STM to the LTM, information must be encoded (converted to a form that the brain can process and store).

Encoding

- *The quality of the memory depends on the attention given to the encoding it.*
- *Information can be encoded using:*

- *shallow encoding, such as repetition, or*
 - *elaborative encoding, such as linking with previous memories, which is considered as a deeper form of encoding.*
- Information can be transferred to the LTM successfully by:
 - rehearsal
 - organisation
 - elaboration of meaning

A. Rehearsal

- Rehearsing a piece of information helps to extend the length of time it is retained within the STM.
- Rehearsing also facilitates the transfer of information from the STM to the LTM.

B. Organisation

- Organising information into logical groups or categories makes it more easily transferable into the LTM.

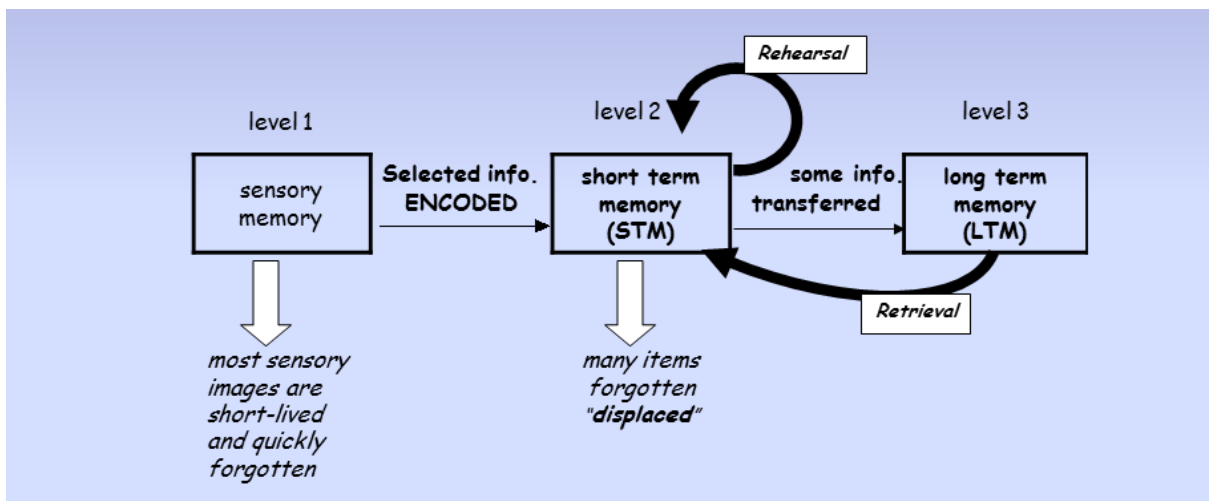
C. Elaboration of meaning

- Elaboration allows us to make information easier to transfer and store in the LTM by building it into a bigger 'story'.
- For example, the name of a person is much more likely to be transferred to the LTM if it is associated with mental images, personality, experiences and smells, such as their perfume/aftershave.

- Information which is stored in the LTM should be able to be retrieved.
- To aid retrieval, information is stored in categories e.g. family, holidays, etc.
- Retrieval is also aided by 'contextual cues', these are signals or reminders relating to the conditions which were present at the time the memory encoded into the LTM.
- The more elaborate and detailed the memory, the more easily it is retrieved.

Memory overview

- The link between the sensory, short term and long term memory is shown in the diagram below:



Location of memory in the brain

- Different types of memories are stored in different areas of the brain.

Episodic and semantic memory – ‘remembering that...’

- Episodic memory is the recall of personal facts, experience and events.

- Semantic memory is the recall of general knowledge, non-personal facts and concepts.
- Both episodic and semantic memories are stored in the cerebral cortex.

Procedural memory – ‘remembering how to...’

- Procedural memory contains information on how to perform particular skills, such as motor skills (e.g. how to swim) and mental skills (e.g. how to read).
- Procedural memories are stored within the motor cortex.

Emotional memory

- Emotional memories are formed as a result of positive or negative associations with particular stimuli.
- Emotional memories involve links between the cortex and limbic system.

Spatial memory

- Spatial memory holds a record of our environment and its spatial orientation.
 - i.e. where the fridge is in your kitchen.
- Spatial memory is stored within the limbic system.

Type of memory	Location within the brain
Episodic and semantic	Cerebral cortex
Procedural	Motor area of the cerebral cortex
Emotional	Cerebral cortex and limbic system
Spatial	Limbic system

The cells of the nervous system

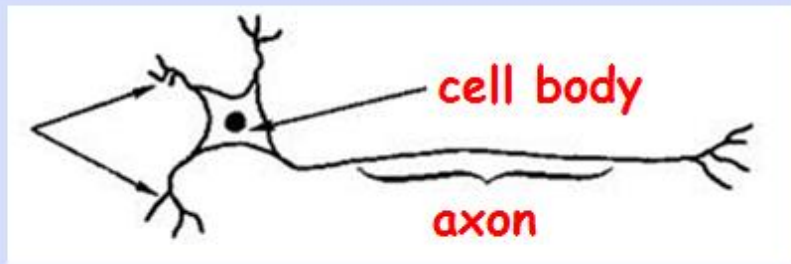
Neurons

- The nervous system is made up of a system of nerve cells, known as neurons, which transmit electrical signals called nerve impulses.
- Glial cells support and maintain these neurons.

Structure of neurons

- All neurons have the same basic structure, they are composed of three key structures:
 - dendrites
 - a cell body
 - axons

dendrites



- Nerve impulses always travel in the same direction:

dendrites → cell body → axon.

- **Cell body** - The cell body contains a nucleus and cytoplasm. The cytoplasm contains organelles such as mitochondria to provide energy for impulses and ribosomes which synthesise proteins (e.g. enzymes) for the synthesis of neurotransmitters.
- **Dendrites** – these fibres receive nerve impulses and carry them towards the cell body
- **Axon** – this fibre carries nerve impulses away from the cell body.
- The axons of neurons are surrounded in a layer of fatty material known as the myelin sheath.
- The **myelin sheath** greatly increases the speed of transmission of a nerve impulse.
- Myelination (the extent to which an axon is covered in myelin) is not complete at birth.
- As a child ages, myelination increases and so does nervous control. The responses of a two year old child are therefore slower than those of an adult.

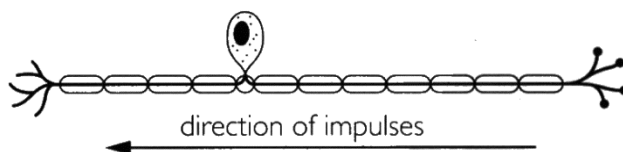
- *Some diseases, such as Polio, Tay-Sachs and Multiple Sclerosis (MS) can damage the myelin sheath and result in loss of muscular co-ordination.*

Types of neurons

- There are three main types of neuron:
 - sensory neuron
 - inter neuron
 - motor neuron
- Each of these neurons has adapted to suit their function.

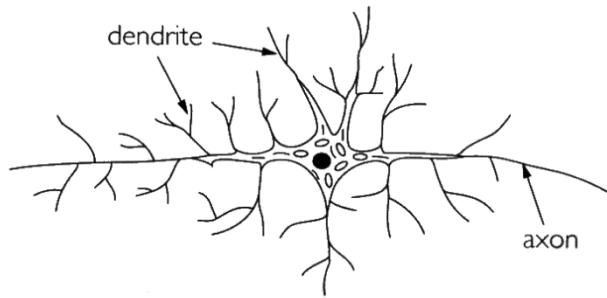
Sensory neuron

- Has dendrites in contact with sense organs.
- These dendrites merge to form a myelinated fibre which carries impulses to the cell body.
- Has a short axon
- Forms connections with neurons in the CNS



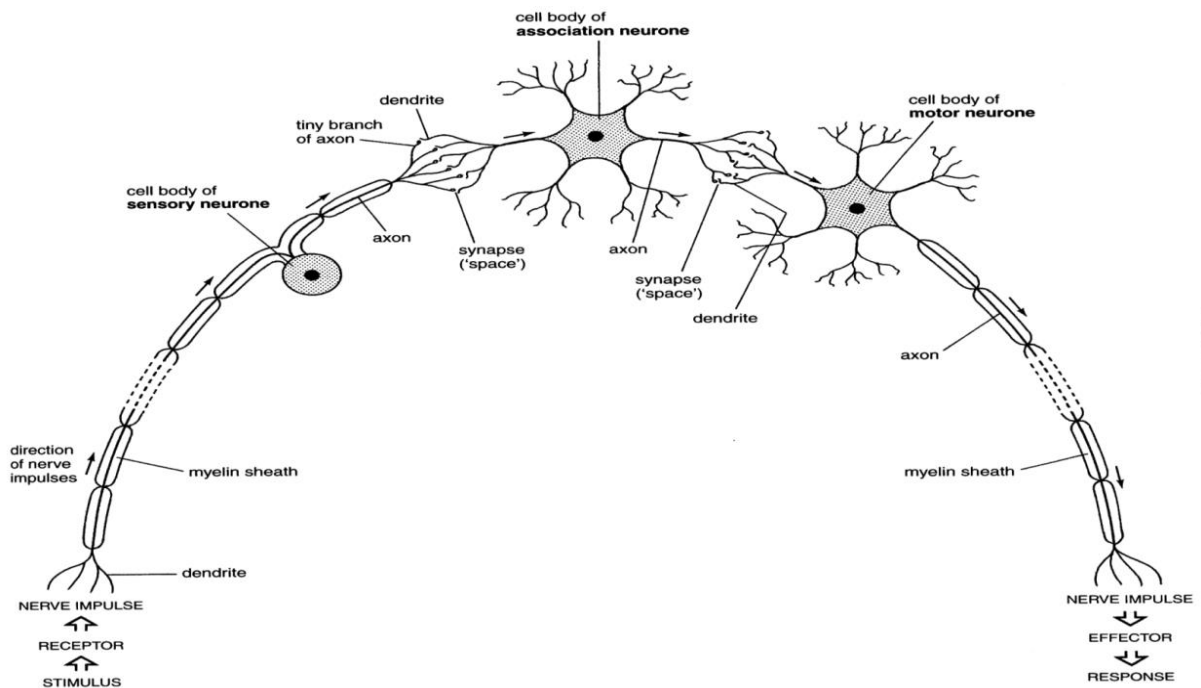
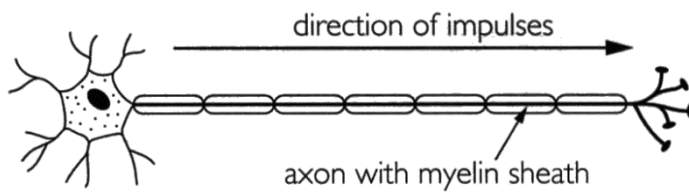
Inter neuron

- Connects sensory neurons to motor neurons.
- Has many dendrites which form many complex, connections.



Motor neuron

- Has short dendrites which connect to neurons in the CNS
- Has a long myelinated axon
- Axon carries nerve impulses to muscle connections.



Glial cells

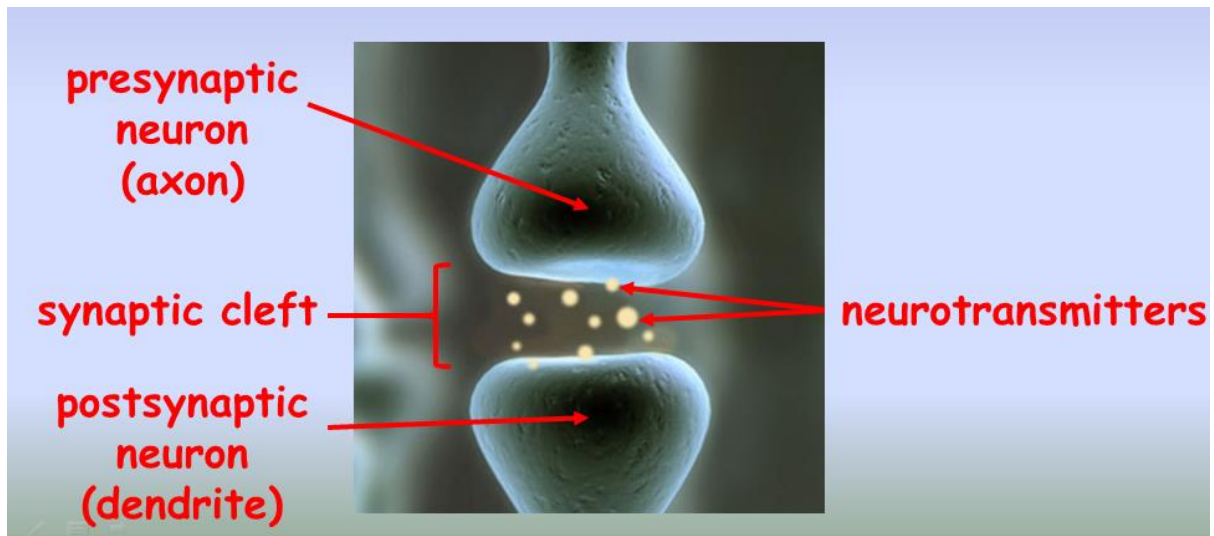
- Glial cells have a number of key functions:
 - physically support neurons
 - produce the myelin sheath
 - control the chemical composition of the fluid surrounding the neuron and so maintain a homeostatic environment.
 - remove debris by phagocytosis

Neurotransmitters at synapses

Synapse

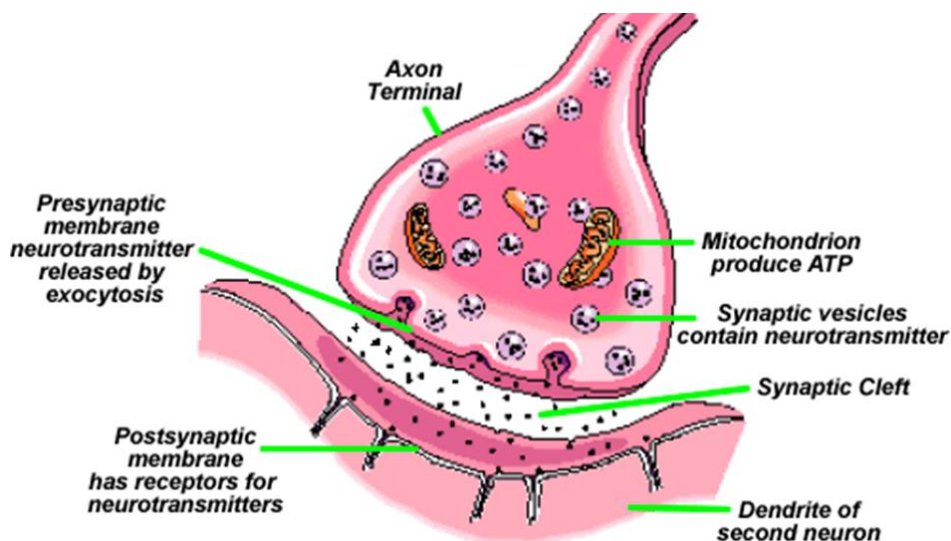
- The tiny area between the ending of the an axon of one neuron and the dendrite of another is known as a synapse.
- The plasma membranes of each neuron are in very close contact and are separated by a narrow space called a synaptic cleft.
- Messages are passed across synaptic clefts by chemicals called neurotransmitters.
- Two examples are acetylcholine and norepinephrine (also known as noradrenaline).

- The neuron before the synaptic cleft is known as the presynaptic neuron.
- The neuron after the synaptic cleft is known as the postsynaptic neuron.



Action of neurotransmitters

- When a nerve impulse passes through a neuron and reaches the end of the axon (known as the axon terminal), many vesicles containing neurotransmitters are stimulated.
- These vesicles move to and fuse with the membrane at surface of the axon terminal. The neurotransmitters within the vesicles are then released (by **exocytosis**) into the synaptic cleft.
- The neurotransmitter then diffuses across the cleft and binds to receptor molecules on the dendrites of the next neuron; this transmits the impulse to the next neuron.



- Neurotransmitters must be rapidly removed as soon as the impulse has been transmitted for the following reasons:
 - to prevent continuous stimulation of the postsynaptic neuron
 - so that the membrane is sensitive to the next stimulus
 - otherwise, the neurotransmitter would continue to have an effect
 - this allows a neurone to send many separate impulses allowing a variety in the rate of impulse transmission.
- Neurotransmitters can be removed from the synaptic cleft by:
 - enzyme degradation - this occurs with acetylcholine, the products of which are absorbed and used to synthesise new neurotransmitters

or

 - re-uptake - this occurs with norepinephrine, which is reabsorbed by presynaptic membrane.
- The continual synthesis and removal of neurotransmitters requires a very large amount of energy.
- Neurones contain a large number of mitochondria to provide ATP.
- *This is why the brain is so easily damaged by oxygen deprivation.*

Excitatory & inhibitory signals

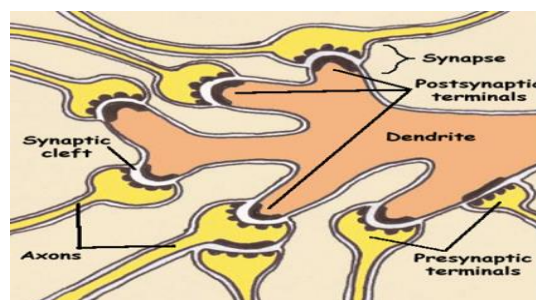
- The receptor cells found on the postsynaptic neuron will determine whether the signal is:
 - excitatory (causes an increase in action e.g. cause muscles to contract) or
 - inhibitory (cause a decrease in action e.g. slow heart rate)

Weak stimuli

- A nerve impulse will only be transmitted across a synaptic cleft if it causes the release of a sufficient number of neurotransmitter molecules; this is known as the threshold.
- Weak stimuli are known as sub-threshold stimuli and are too weak to cause the transmission of a nerve impulse.
- When the stimulus is weak, the synapse acts as a gap which the impulse cannot cross and the stimulus is 'filtered out' due to insufficient secretion of neurotransmitters.

Summation

- A single weak stimulus will not trigger the release of enough neurotransmitters to cause transmission of a nerve impulse.
- However, a series of weak stimuli from many neurons can bring about an impulse.
- The cumulative effect of a series of weak stimuli which triggers an impulse is known as summation.
- If a weak stimulus passed along one axon this would not trigger enough neurotransmitters to be released to reach the threshold.
- When many axons release their neurotransmitter at the same time or in rapid succession, this releases enough chemical to fire a response.



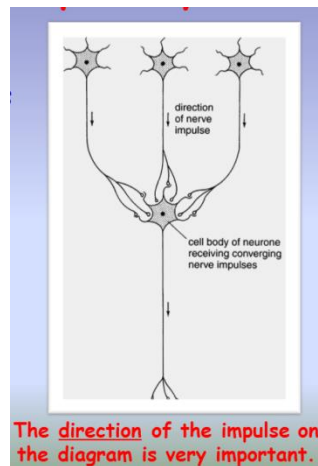
Neural Pathways

Complex neural pathways

- Neurons are connected to others in many different ways in the CNS.
- This allows many complex interactions to occur between neurons and so allows the nervous system to carry out many complex functions.
- There are three main neural pathways:
 - converging
 - diverging
 - reverberating

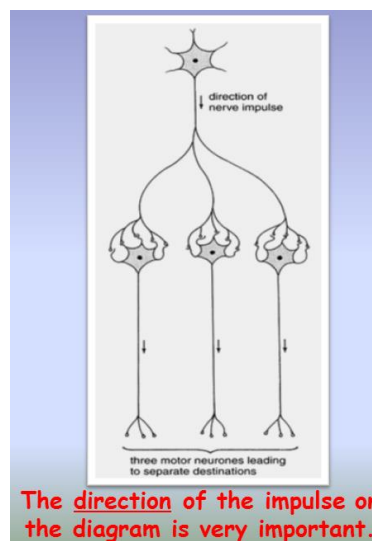
1. Converging neural pathways

- Converging neural pathways have many neurons coming together and feeding impulses to **one** neuron.
- This allows for signals to be brought together for a combined or concentrated effect (e.g. summation) at one neuron.
- *An example of this can be found with the convergence of the neurons from rod cells in the retina of the eye.*



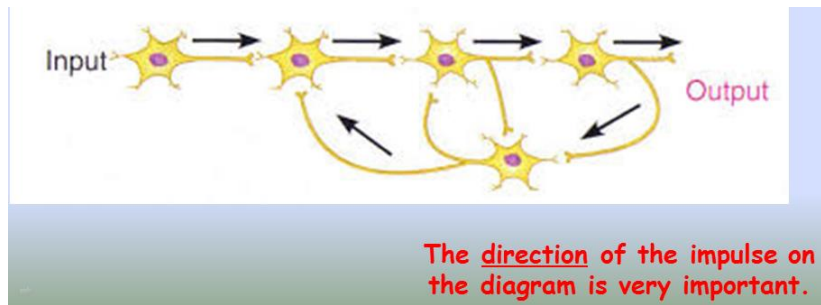
2. Diverging neural pathways

- Diverging neural pathways have one neuron branching out and feeding impulses to **many** neurons.
- This allows for signals from a single source to be sent to several destinations and allows us to co-ordinate control (e.g. when threading a needle).



3. Reverberating neural pathways

- Reverberating neural pathways possess neurons later in the pathway which form connections with neurons earlier in the pathway.
- This allows for nerve impulses to be recycled and repeatedly stimulate the circuit, these impulses will only stop when they are no longer required.



Plasticity of response

- The ability of brain cells to become altered and form new neural pathways as a result of new environmental experiences is known as plasticity of response.
- This allows new neural pathways to be formed during early development when learning many new skills.
- Major plasticity of response can occur after brain damage (e.g. stroke) and allows undamaged cells to form new neural pathways to take on the functions of the damaged area.
- Minor plasticity is used to suppress reflexes (e.g. blinking or prevent the body dropping a hot object) or suppress sensory responses (such as visual distractions).

Neurotransmitters, mood and behaviour

Endorphins

- Endorphins are neurotransmitters which act like natural painkillers by stimulating neurons which are involved in reducing the intensity of pain.
- Endorphin production increases in response to:
 - severe injury

- prolonged and continuous exercise
- physical & emotional stress
- certain foods
 - (e.g. chocolate and chilli peppers)
- Increased levels of endorphins can also bring about other responses within the body, such as:
 - euphoric feelings (intense happiness)
 - regulation (modulation) of appetite
 - release of sex hormones

Dopamine

- Dopamine is a neurotransmitter which induces the feeling of pleasure.
- Dopamine is also involved in reinforcing beneficial behaviour (such as satisfying hunger by eating) by activating the reward pathway.
- The reward pathway involves neurons which secrete or respond to dopamine.

Neurotransmitter related disorders

- Below are some examples of neurotransmitter related disorders:

Disorder	Cause	Treatment
Alzheimer's disease	Loss of cells synthesising acetylcholine.	Cholinesterase inhibitors
Parkinson's disease	Loss of dopamine synthesising neurons.	Monamine oxidase inhibitors and the potential use of adult stem cells
Schizophrenia	Overactive dopamine system	The use of dopamine antagonists
General anxiety disorders	Imbalance in serotonin and norepinephrin	The use of GABA agonists and beta blockers
Depression	Low levels of serotonin	Norepinephrine re-uptake inhibitors and monoamine oxidase enzyme inhibitors

- Many drugs which treat neurotransmitter related disorders are similar to neurotransmitters.

Treatment Drugs

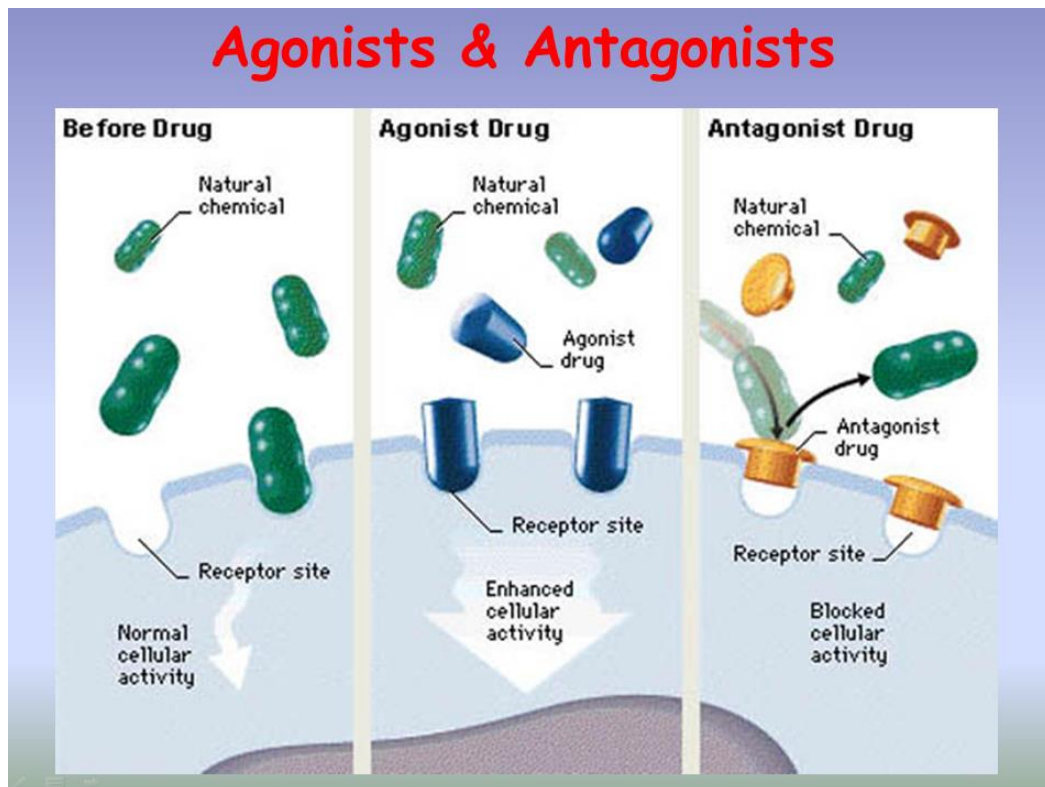
Agonists

- Agonists are chemicals that bind to and stimulate specific receptors on postsynaptic neurons.
- Agonists mimic the action of natural neurotransmitters and so normal cell responses occur (i.e. nerve impulse is transmitted).

Antagonists

- Antagonists are chemicals that bind to and block specific receptors on postsynaptic neurons.
- Antagonists, by blocking the receptor sites, prevent the normal neurotransmitter from acting.
- Antagonists can greatly reduce or even stop the normal transmission of nerve impulses.

- Other drugs, known as inhibitors, inhibit the enzymes which degrade neurotransmitters or inhibit re-uptake.



Mode of action of recreational drugs

Recreational drugs

- Many recreational drugs can mimic the action of neurotransmitters and will affect the transmission of nerve impulses in the reward circuit of the brain.
- Recreational drugs can stimulate the release of neurotransmitters, acts as agonists or antagonists and inhibit their reuptake or enzyme degradation.
- Recreational drugs therefore alter a person's neurochemistry and so can lead to changes in:
 - mood
 - *e.g. happier/more confident/more aggressive*
 - cognition

- *person becomes poorer at mental tasks such as problem solving and decision making*
- perception
- *misinterpretation of environmental stimuli e.g. colours, sounds, sense of time*
- behaviour
- *person is able to stay awake for longer and talk about themselves endlessly*

Drug addiction/tolerance

- Drug addiction is a chronic disease. The sufferer will compulsively seek out and use a drug regardless of the consequences.
- The initial use of the drug is often voluntary but the changes which occur after use soon override a person's control.
- Drug tolerance occurs when a person's reaction to an addictive drug decreases in intensity although the concentration is the same. A large dose is then required to bring about the original effect.

Sensitisation

- Sensitisation is an increase in the number and sensitivity of neurotransmitter receptors.
- This occurs as a result of exposure to drugs which are antagonists, which block receptors; the body then responds by increasing the number of these receptors.
- Sensitisation leads to addiction.

Desensitisation

- Desensitisation is a decrease in the number and sensitivity of neurotransmitter receptors.
- This occurs as a result of exposure to drugs which are agonists, which stimulate receptors and cause feelings of euphoria.
- The body responds to this overstimulation by decreasing the number of these receptors and so a larger dose is required to bring about the original effect.
- Desensitisation leads to drug tolerance.

1. The Effect of Infant Attachment Communication

- Humans are social animals which involves communicating with each other.
- Social Behaviour involves transmitting and receiving information using signs and signals.
- Communication in humans begins at birth.
- The period of dependency of a human infant upon adults is lengthy.

Infant attachment

- Is the emotional tie that binds a baby to its carer.

- Contact comfort plays basic role in attachment between human infants and their carer.
- At first attachment is indiscriminate on the baby's part.
- Specific attachment to the mother becomes evident between 6 and 9 months.
- Early infant attachment is important in laying the foundation for the future formation of stable relationships.
- Infants that form secure attachments are more likely to investigate their immediate environment helping develop cognitive abilities

(Cognitive abilities are the brain-based skills we need to carry out any task from the simplest to the most complex.)

Socialisation and Learning

- Socialisation is the gradual modification of developing individual's behaviour in order to accommodate the demands of an active social life within the community.
- Young humans are dependent on adults for a long period of development during childhood and adolescence.
- This provides time for socialisation and learning.

Methods of Control

- The quality of a developing child's social competence is affected by the method of control adopted by their parents.
- Authoritative control generally results in greater social competence than permissive control

• Examples of Control

Method Of Control	Behaviour Adopted By Parent
Authoritative	Is warm, nurturing and emotionally supportive towards the child
(demanding but responsive)	Sets limits, rules, high standards and explains reasons
	Gives direction and expects responsible behaviour in return.
	Reasons with the child and demonstrates respect
Permissive	Is warm and nurturing
(excessively lenient)	Does not set limits, lay down rules or assign responsibilities
	Adopts 'no discipline' approach
	Allows the child to regulate their own behaviour

Parental Control

- As children develop, different methods of control can influence social competence.
- Children with authoritative parents are more likely to develop into self-reliant, academically successful and socially accepted adults.

2. The Effect of Communication

- Communication is the exchange of information from one individual to another.
- Communication can be non-verbal and verbal.

Non-Verbal Communication

- Non-verbal communication is sending and receiving wordless messages.

- Facial expressions can convey messages.
- Eye Contact is another method of non verbal communication.
- Non verbal communication can be measured by observing facial expression, eye contact, touching, tone of voice and physical proximity.
- Non verbal communication is important in forming relationships between individuals and can signal attitudes and emotions as well as acting as an aid to verbal communication.

Verbal Communication

- Language is a system that combines basic sounds and symbols.
- Short term- language allows humans to convey information for day to day living.
- Long term –language allows transfer of information from one generation to the next. This promotes acceleration of learning and intellectual development.
- Verbal communication is used in the transmission of knowledge, development of culture and social evolution.

3. The Effect of Experience

- Learning is a change in behaviour as a result of experience

Effect of Practice on Motor Skills

- A motor skill is a function, which involves the precise movement of muscles in order to perform a specific act.
- Practice improves performance as neural pathways are established
- The repeated use of a motor skill results in a Repetition of the skill is thought to increase synaptic connections between neurons. This leads to formation of a 'motor memory'
- motor pathway in the nervous system being established

Imitation

- Human behaviour maybe learned by observation and imitation.
- Most people learn a new task more quickly by imitating an expert than following instructions

Trial and Error Learning

- Trial and Error Learning is the process of finding a solution to a problem by trying many possible solutions and learning from mistakes until a way is found.

Reinforcement

- Animals are motivated to learn by factors such as hunger and thirst.
- The hungry rat's behaviour was rewarded by food –positive consequence.
- The behaviour is repeated and as result becomes reinforced.
- Reinforcement is the process that makes an organism tend to repeat a certain piece of behaviour.
- The reinforcer increases the probability of response being repeated.

Shaping

- Shaping is the process by which a desired pattern of behaviour is eventually obtained from the learner by the trainer reinforcing successive approximations of the desired response. e.g. tying shoe laces.

Extinction of Behaviour

- Extinction is the name given to the eventual disappearance of a behaviour pattern when it is no longer reinforced.

Learning

- Reinforcement, shaping and extinction of behaviour are part of trial and error learning.
- Reinforcement is when behaviour patterns that have a positive consequence for the individual are likely to be repeated.
- Shaping is rewarding of behaviour that approximates to the desired behaviour.
- Extinction happens when behaviour patterns are not rewarded and so are likely to disappear.

Generalisation

- Generalisation is the ability to respond in the same way to many different but related stimuli.

Discrimination

- Discrimination is the ability to distinguish between related stimuli and give different responses.
- Discrimination is taught by reinforcing the desired response.
- Learning to discriminate is an essential part of a child's preparation for coping with everyday life.

Generalisation and Discrimination

Generalisation and Discrimination may result in for example a child who has been bitten by dog to fear all dogs (generalisation) or only to fear large dogs (discrimination).

4. The Effect Of Group Behaviour And Social Influence

Social Facilitation

- The presence of others improves performance (especially in a competitive situation) is called social facilitation.

De-individuation

- Once under group pressure, individuals think and act differently from the way that they would if they were on their own.
- Decisions and behaviour now depend less on the members 'individual personalities and more on the collective influence of the group.
- The loss by an individual of personal identity when in a group is called de-individuation
- De-individuated people feel indistinguishable from others in the group and are more likely to act mindlessly and do things that they would never consider doing on their own.
- De-individuation is often used to explain the anti-social behaviour of some groups which would not be shown by individuals from these groups on their own.
- Loss of personal identity in a group leading to diminished restraints of behaviour.

Internalisation

- Internalisation is the changing of beliefs as a result of persuasion.

- *Media, advertising, governments attempt to persuade people to change their current beliefs and adopt a different set of beliefs.*
- *They attempt to persuade us to internalise their beliefs.*

Identification

- Identification is the changing of beliefs to be like an admired influencing source.
- *Identification can result in a person changing their beliefs to be deliberately like another admired person.*