

HSC Biology

Communication

Focus 1:

✚ Humans, and other animals, are able to detect a range of stimuli from the external environment, some of which are useful for communication.

Identify the role of receptors in detecting stimuli.

- Stimulus:
 - Any form of energy the body is able to detect by means of its receptor.
- Receptor:
 - Sensory cell or cell part that may be activated by specific stimulation in the internal or external environment.
 - Finely branched peripheral endings of sensory neurones.
 - Amplify or focus energy of a stimulus.
 - Convert information from environment into electrochemical signals that are translated by the brain.
- Types of receptors:
 - *Chemoreceptors:*
 - Detect chemical energy.
 - Ions or molecules dissolved in body fluids close to receptor.
 - *eg.* Olfactory or taste receptors.
 - *Mechanoreceptors:*
 - Detect mechanical energy.
 - Changes in pressure, position, acceleration.
 - *eg.* Touch, stretch, hearing (hair cells in organ of Corti), equilibrium (balance).
 - *Photoreceptors:*
 - Detect photon energy of visible & U.V. light.
 - *eg.* Eyes (rods & cones).
 - *Thermo receptors:*
 - Detect radiant energy.

Explain that the response to a stimulus involves:

- **Stimulus.**
 - **Receptor.**
 - **Messenger.**
 - **Response.**
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- **Messenger:**
 - A nerve impulse.

 - **Effector:**
 - Organ that receives message to carry out a response.

 - **The response to a stimulus:**
 - Stimulus detected by a receptor.
 - Receptor send message to a messenger.
 - Nerve or hormone.
 - Messenger passes message to an effector.
 - Gland or muscle.
 - Effector responds to information.

Identify Data Sources, Gather and Process information from secondary sources to Identify the range of senses involved in communication.

- Animals use a combination of senses for communicating.
 - Importance of each sense differs between animals.

Sense	Human Example	Other Example
<i>Visual (sight)</i>	<ul style="list-style-type: none"> - Facial expressions. - Display emotions. 	<ul style="list-style-type: none"> - Bioluminescence in fireflies. - Blue-ringed octopus glows blue when preparing to attack.
<i>Olfactory (smell)</i>	<ul style="list-style-type: none"> - Used minimally for communication in humans. - Scent of partners. 	<ul style="list-style-type: none"> - Release of pheromones to show presence. <ul style="list-style-type: none"> - <i>eg.</i> Moths & cows. - Some beetles emit stink to deter predators.
<i>Auditory (hearing)</i>	<ul style="list-style-type: none"> - Language used to convey info. <ul style="list-style-type: none"> - Tone represents mood. - Main method of communication. 	<ul style="list-style-type: none"> - Insects use sounds as a warning. <ul style="list-style-type: none"> - <i>eg.</i> Cicada defence mechanism. - Moths hear ultrasonic bat calls & avoid being eaten. - Dolphins use echolocation.
<i>Tactile (touch)</i>	<ul style="list-style-type: none"> - Used in bonding, close relationships. - Show aggression. 	<ul style="list-style-type: none"> - Bees dance to communicate location of food. - Great white shark feels vibrations in water. - Sharks bite to test. <ul style="list-style-type: none"> - Detect electrical current.
<i>Taste</i>	<ul style="list-style-type: none"> - Not used by humans. 	<ul style="list-style-type: none"> - Some animals have bitter taste to show poisonous. <ul style="list-style-type: none"> - Monarch butterflies. - Ants (formic acid).

