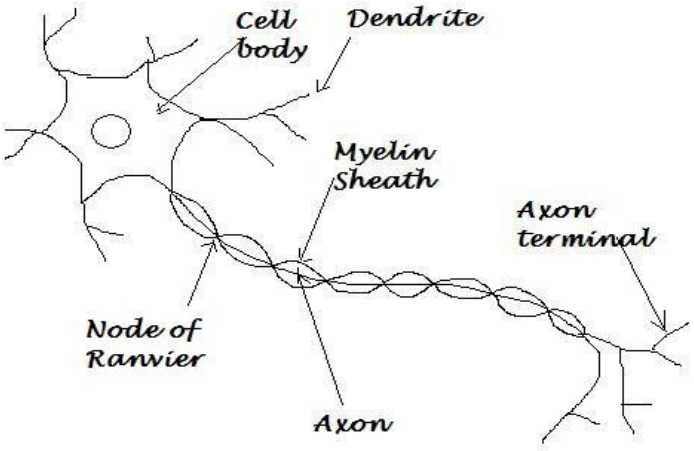
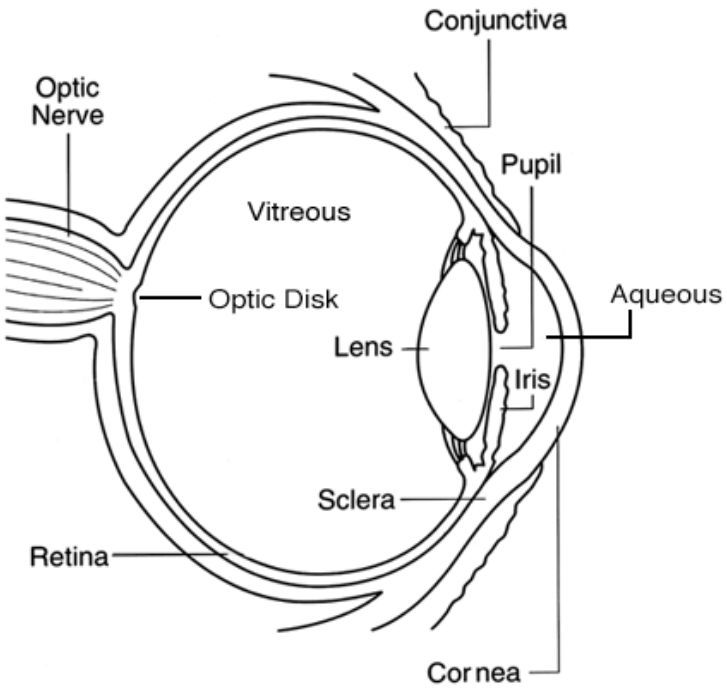
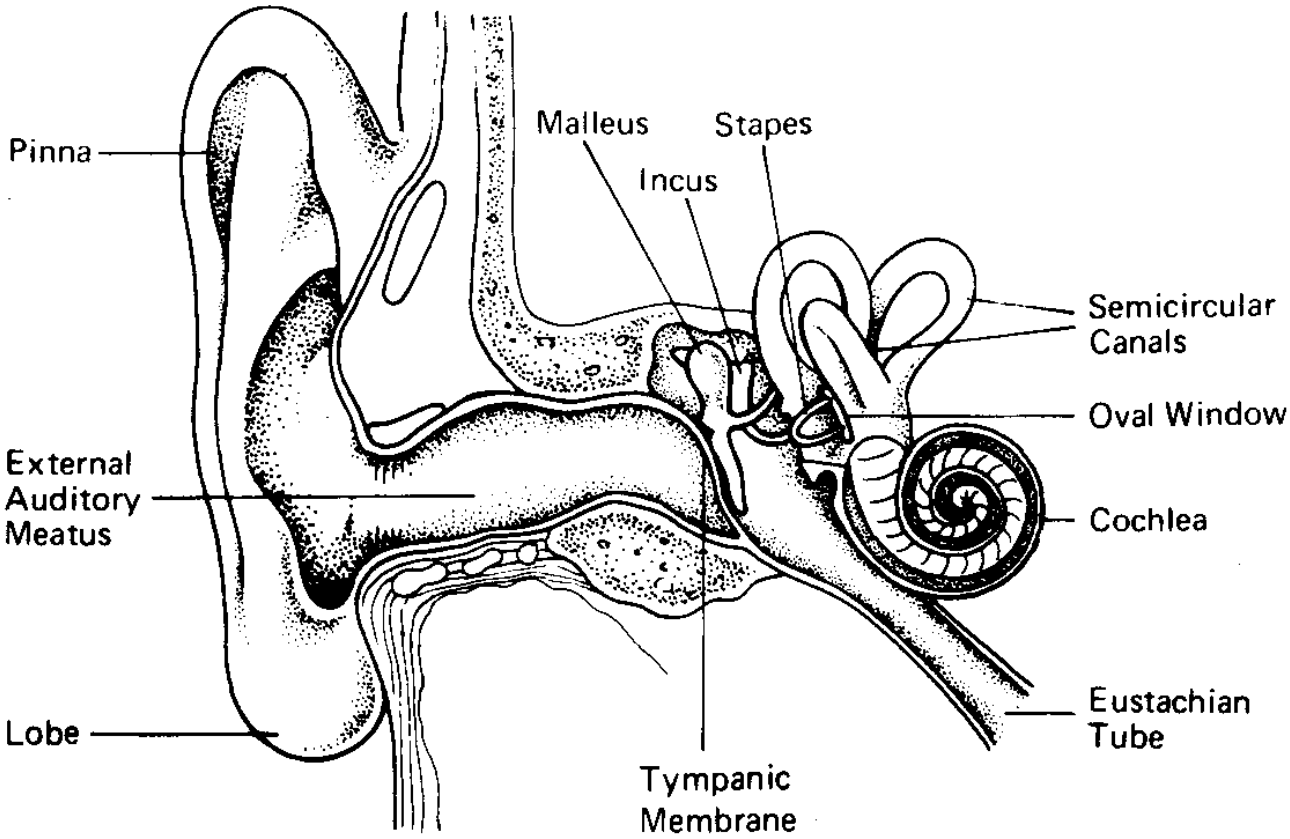
What is the function of the nervous system?	To transmit messages from one part of the body to another part of the body or from one's environment to the body. A stimulus causes a response.
What is the nervous system of a one celled organism like?	One celled organisms do not have nervous systems. Instead, they respond to stimuli through **taxis**- the entire organism moves away from or toward a stimulus. • Thermotaxic (temperature) • Chemotaxic (chemicals) • Thigmotaxic (touch) • Phototaxic (light)
What is the nervous system of a coelenterate (hydra, jellyfish) like?	These organisms are coordinated so that they can capture food. They have a **nerve net**- specialized nerve cells that are all interconnected. This means that the organism feels and senses stimuli, but it does not know where the stimuli are. A coelenterate's usual response to any stimulus is to hide.
What is the nervous system of a planarian like?	These organisms exhibit **cephalization**- they have heads. They also have **anterior eyespots** on their heads to sense light from dark. They have a **ganglia**- an accumulation of nervous cells- in their heads and a **nerve cord** running down their bodies. Their bodies have anteriors and posteriors (head and lower half) and are divided into dorsal and ventral (top and bottom) sections.
What is the nervous system of an earthworm like?	The first true nervous system. 1. Central nervous system a. Brain b. Nerve cord 2. Peripheral nervous system The brain only relays information, so the earthworm can live without it.
What is the nervous system of an arthropod like?	Fairly developed. It has nerve cords and a brain that does more than simply relay information. It has incredible smell, hearing, and touch, but less-than-great sight. It has a compound eye, made up of many lenses, so it sees in a mosaic.
What is the nervous system of a vertebrae like?	Humans have a **central nervous system**, being the **brain** and **spinal cord** and containing all types of neurons, as well as a **peripheral nervous system**, which is the nerves in all parts of the body, containing the sensory and motor neurons. The central nervous system relays messages, processes information, and analyzes information, while the peripheral nervous system picks up impulses and carries out action.
What is a neuron?	A functional unit of the nervous system. It has a **cell body**, where it has a nucleus and other organelles and takes care of regular cell functions; **dendrites** branching off of the cell body (highly branched, in fact, for surface area) that pick up stimuli; an **axon**, which is the long, fibrous structure that relays messages; a **myelin sheath** to protect and insulate the axon, making sure it isn't stimulated by anything else; **axon fluid** between the actual axon and the sheath; cells on the sheath, known as **schwam cells**, and **end brushes/sole feet/end bulbs/etc**. at the bottom, [also highly branched] to pass the message on to other neurons.  The myelin sheath divides the neuron into **nodes**. Impulses travel from node to node very quickly. (Image taken from http://sospokesaroj.wordpress.com/2009/03/19/why-neuroscience-is-awesome/) (An even better diagram is in the yellow handout book, page 111).
What types of neurons are there?	**Motor** neurons, which carry messages from the central nervous system to effectors (glands, muscles); **sensory** neurons which carry impulses from receptors (sense organs) to the central

	nervous system; **associative/connector** neurons which connect between motor and sensory neurons within the spinal cord.
How does a neuron work?	When a **threshold** stimulus (minimum to cause a response) stimulates a dendrite, the neuron is in **resting potential**. It has positive sodium ions outside the cell body it and negative potassium ions inside the cytoplasm, creating a negative charge outside and a positive charge inside. So if the neuron is stimulated, **depolarization** takes place- the ions switch places. This happens because the stimulus opens chemical pathways in and out of the neuron. After the stimulus passes, **re-polarization** takes place so the neuron is ready to accept new stimuli. The nervous impulse in **electrochemical**.
How does an impulse move from neuron to neuron?	Neurons do not touch one another; between each other there is a **synapse**/gap/cleft. At the end of each neuron, the **end brushes/sole feet/end bulbs/etc.** contain mitochondrion and vesicles which secrete **neurotransmitters**, chemicals that signal to the next neuron to depolarize. Some of these chemicals are serotonin, melatonin, **acetylcholine**, and dopamine. A stimulus causes depolarization from the point of stimulation to the brain. The point in the brain where the message terminates signifies the location where the first neuron was stimulated.
How do reflexes work?	Reflexes are involuntary, thoughtless actions taken by the body to protect itself. Reflexes travel along a **reflex arc.** When a receptor is stimulated, the stimuli passes along a sensory path, the afferent neuron, straight to the spinal cord. There, it is directed along a motor path, the efferent neuron, to a muscle. The brain is not involved.
How do our senses work?	There are five general categories of sensory receptors: • Pain receptors: everywhere except the brain. These detect chemicals released by damaged cells. They indicate danger, injury, and disease. • Thermoreceptors: skin, body core, hypothalamus. These detect variations in temperature. • Mechanoreceptors: skin, skeletal muscle, inner ears. These detect touch, pressure, muscle movement, sound, and motion. • Chemoreceptors: nose, tastebuds. These detect chemicals in the external environment. • Photoreceptors: eyes. These detect light.
How do eyes work?	Light enters the eye through the **cornea**, a tough, transparent layer of cells with no blood vessels at all. The cornea focuses light and it passes through the eye's anterior chamber. This chamber is filled with **aqueous humor**, a fluid. At the back is the **iris**, a colored disc. In the iris's center is the **pupil**, an opening that is opened and closed by the iris muscle depending on the amount of light in the environment. (The brighter it is, the smaller the pupil becomes.) These are surrounded by the **sclera**, the white, hard part of the eye. Behind the iris is the **lens**. Small muscles focus it, so it can see objects both near and far. Behind the lens is a chamber, filled with a fluid, **vitreous humor**. The lens focuses light on the retina, which is at the back of this chamber. The retina is covered by a layer of photoreceptors, which convert light into nerve impulses, which they send to the central nervous system. Photoreceptors called cones detect color, while rods are more sensitive to light, but only see black and white. Cones are more concentrated in the middle of the eye, so peripheral vision is mainly black and white. The impulses created by these photoreceptors move along the optic nerve, to the brain. (We don't have to know the optic disc or the conjunctiva. Image taken from http://www.glaucoma.org/learn/eye-anatomy.gif) 

How do ears work?	**Hearing**: Sound is simply vibrations in the air. The ear is able to pick up the pitch and voulume of these vibrations. They travel through the **auditory/ear canal**, causing the **tympanum** (eardrum) to vibrate. Tiny bones, the **anvil (incus), hammer (malleus), and stirrup (stapes)**, pick up these vibrations. They transmit them to the **oval window**. Vibrations of the oval window create waves of pressure that move through the fluid-filled **cochlea**. The cochlea is filled with hair cells, which are moved back and forth by the pressure waves. This movement triggers nervous impulses that are sent to the brain, via the **cochlear** or **auditory** nerve.
	Balance: The ear contains three **semicircular canals**, within the inner ear. These and two tiny sacs between them monitor body position in relation to the force of gravity. They're all filled with fluid and hair cells, and movement of the body moves the fluid, triggering nervous impulses by moving the hair. These are sent to the brain.



The structure of the ear.

Also know the round window: it looks like it's an opening to the cochlea.
Extra fluid and stuff goes down to the pharynx via the eustachian tube.

How do we smell?	Chemoreceptors in the lining of the naval passageway respond to chemicals and send impulses to the brain via sensory nerves.
How do we taste?	The sense organ that detects taste is the tastebuds. They're in the mouth, mostly on the tongue, and contain chemoreceptors that detect sweet, sour, bitter, and salty.
What is the cerebral cortex?	The outer surface of the brain. It's composed of **gray matter**, which is highly convoluted for more surface area, so more neurons can be there. It has two hemispheres. Both are able to analyze data from sense organs, recall and store memory, learn, think, and make decisions. Each hemisphere is divided into four lobes.
What does the left hemisphere do?	Sequential Analysis: systematic, logical interpretation of information, such as language, math, abstraction, and reasoning. Memory is stored in a language format.
What does the right hemisphere do?	Holistic Functioning: processing information from various sense organs in order to provide an entire view of one's environment, skills related to space and movement. Memory is stored in auditory, visual, and spatial (related to space) formats.
What is the corpus collosum?	Communication between the two hemispheres.
What does the frontal lobe do?	This is at the front of the brain. Cognition and memory. The foremost part houses the ability to concentrate and focus. This lobe also has one's judgement, inhibitions,

	personality, ("Gatekeeper" region); voluntary movement (Brodman's Motor Cortex); storage of motor patterns and voluntary activities (Premotor cortex). Speech is also here.
What does the parietal lobe do?	This is behind the frontal lobe. Processes sensory input and body orientation.
What does the occipital lobe do?	This is at the very base of the brain. Here, vision is first received and associated with things.
What does the temporal lobe do?	This is at the bottom of the brain, near the front. Here, sound is received and interpreted, behavior is expressed, speech is received, and information is retrieved.
What is the thalamus?	This part of the brain relays messages between the lower brain centers and the cerebral cortex.
What is the hypothalamus?	This part governs functions such as eating (fullness), helps govern the endocrine system (hormones), and is linked to emotion and reward.
What is the pituitary gland?	The master endocrine gland.
What is the medulla?	This governs the autonomic nervous system, controlling heartbeat and breath rate.
What is the spinal cord?	A pathway for neural fibers traveling to and from the brain; also controls reflex action.
What is the cerebellum?	A lumpy thing at the base of the brain, this coordinates voluntary movement and balance.
What is the pons?	This relays information between the cerebrum and the cerebellum and controls waking.

Image from http://www.cartage.org.lb/en/themes/sciences/lifescience/generalbiology/Physiology/NervousSystem/Brain/brain_3.gif