Chapter 19.3 – The Senses

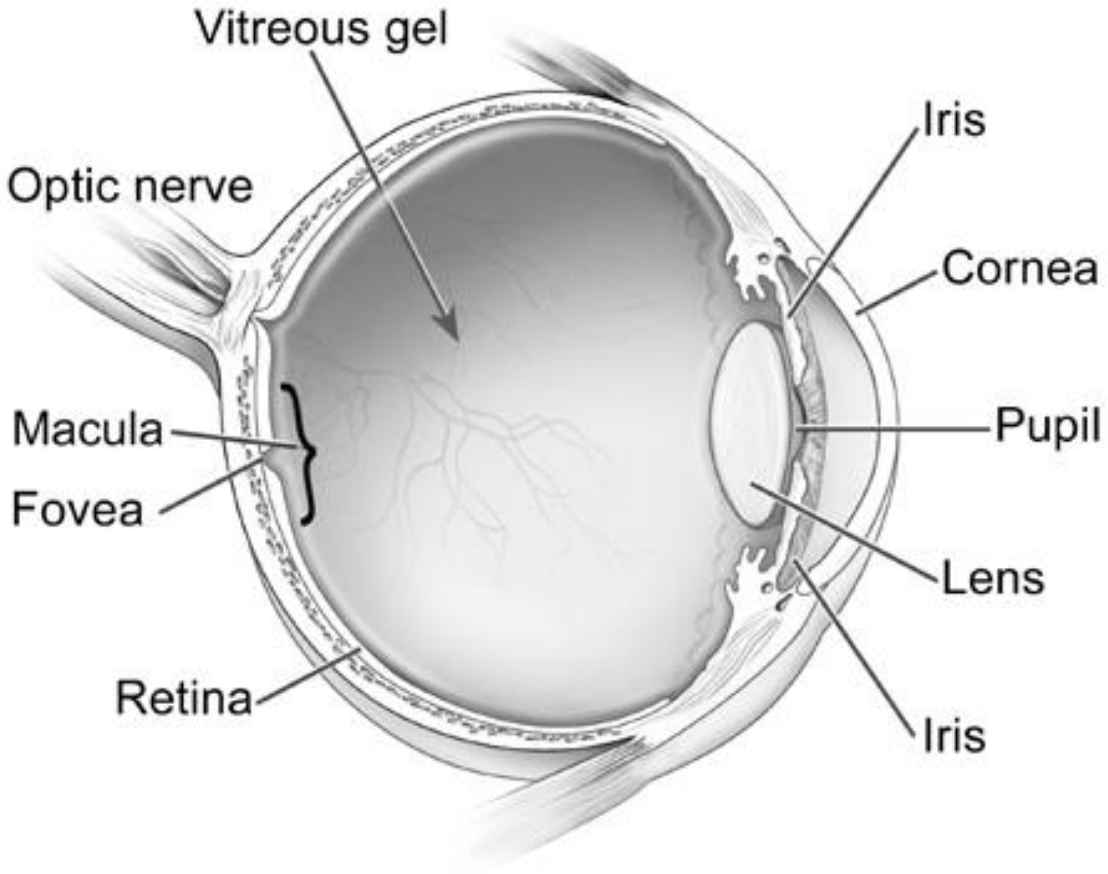
Objectives:

Section 3: The Senses

- Describe how your eyes enable you to see
- Locate and describe the functions of each of the following parts of the eye: sclera, cornea, aqueous humor, iris, pupil, lens, ciliary muscle, vitreous humor, retina, fovea, blind spot, choroids, optic nerve
- Differentiate between nearsightedness and farsightedness
- Describe how you hear and maintain your sense of balance
- Locate and describe the functions of each of the following parts of the ear: auditory canal, eardrum, semicircular canals, cochlea, auditory nerve.
- Describe how your sense of smell and taste work together
- Describe how your skin is related to the sense of touch

Helpful Links

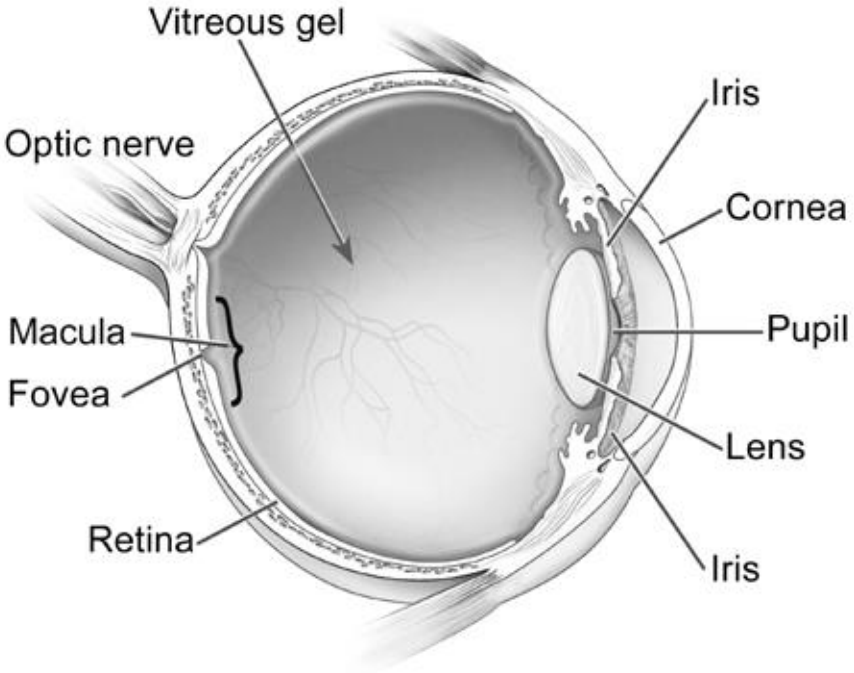
- Kids' Health: Eyes
- Kids' Health: Ears



Eye Parts

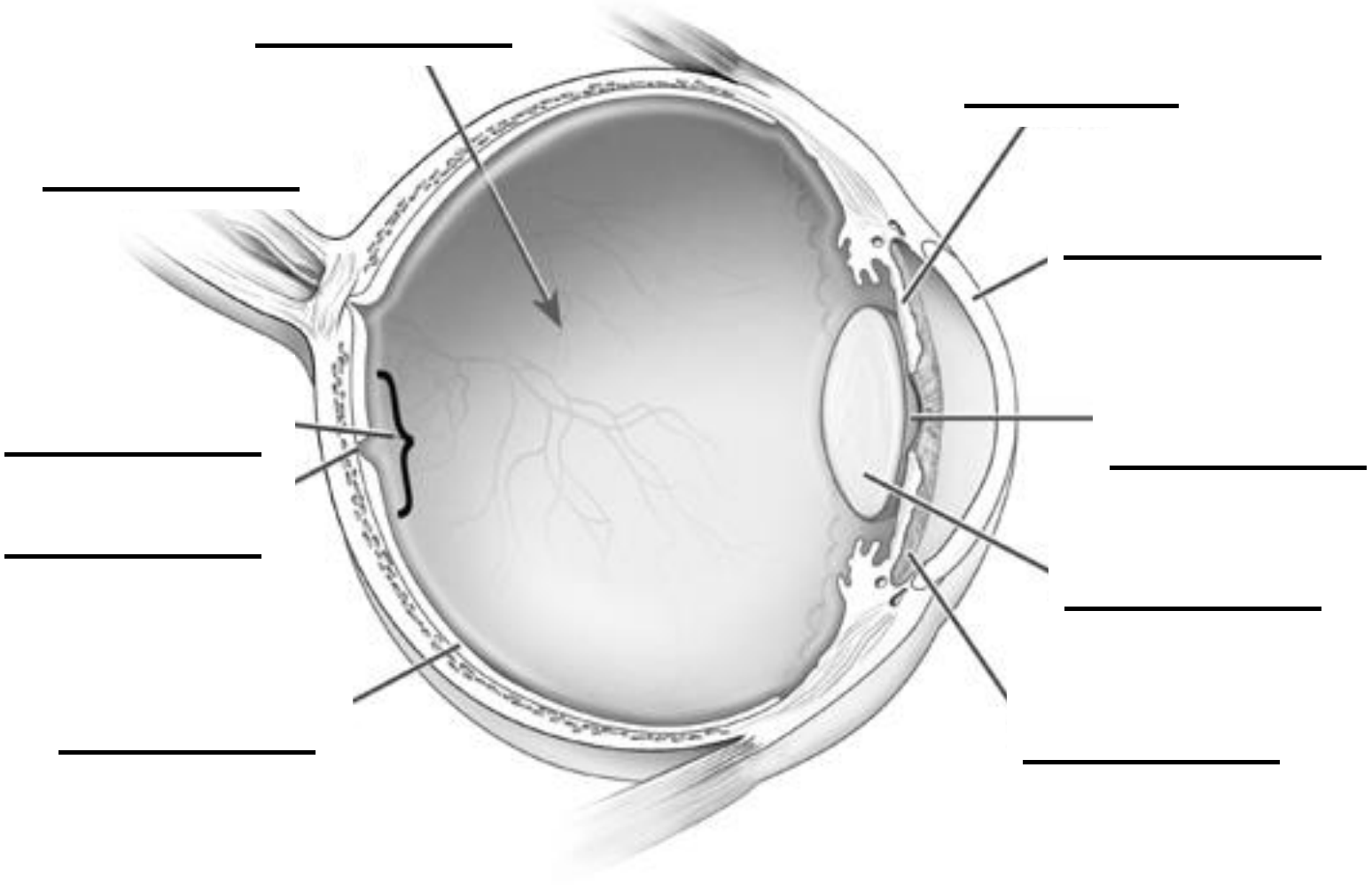
1. _____- sends impulses to cerebrum
2. _____- retina attaches to nerve; no vision
3. _____ - sharpest vision
4. _____ - receptor; changes light to impulses

Eye Parts (cont.)



5. _____- shapes cornea
6. _____ - allows light to enter
7. _____ - bends light into pupil
8. _____ - focuses light onto retina
9. _____ - controls amount of light
10. _____- pull lens for focusing
11. _____ humor - shapes eyeball; holds retina
12. _____ - protective covering
13. _____ - blood vessels

Practice Eye Diagram



Find your blind spot! Using the diagram below, fixate on the cross, close your right eye and hold the figure about 1.5 feet from your face. When the filled circle disappears, its image is on your blind spot. Fixate on the lower cross. Note how the line appears continuous.

Computer scanned images of the eye

The iris is as individual as a finger print and even more detailed!

Vision Problems

_____ means Trouble seeing objects far away

Concave lens for correction

http://www.flickr.com/photos/leenda_k/2990685689/

_____ means Trouble seeing objects close up

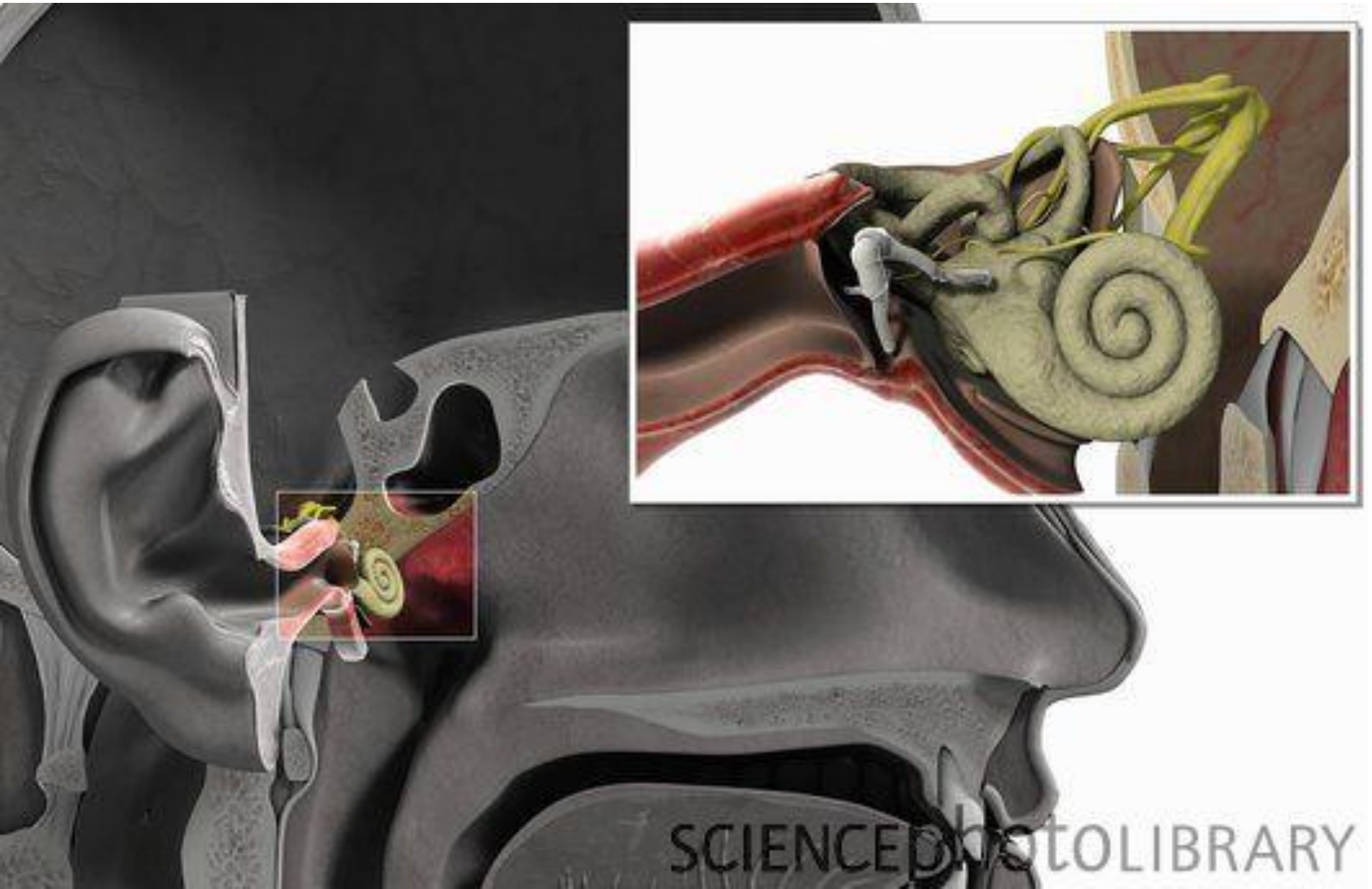
Convex lens for correction

Hearing

- Outer Ear
  - Funnel-shaped to collect sound
- Middle Ear
  - Eardrum – Membrane that vibrates it when sound hits it
  - Hammer, Anvil & Stirrup- receive vibrations to pass them on into inner ear
- Inner Ear
  - Cochlea - transfers impulses to brain through the auditory nerve.
  - Semicircular canals – responsible for sense of balance.

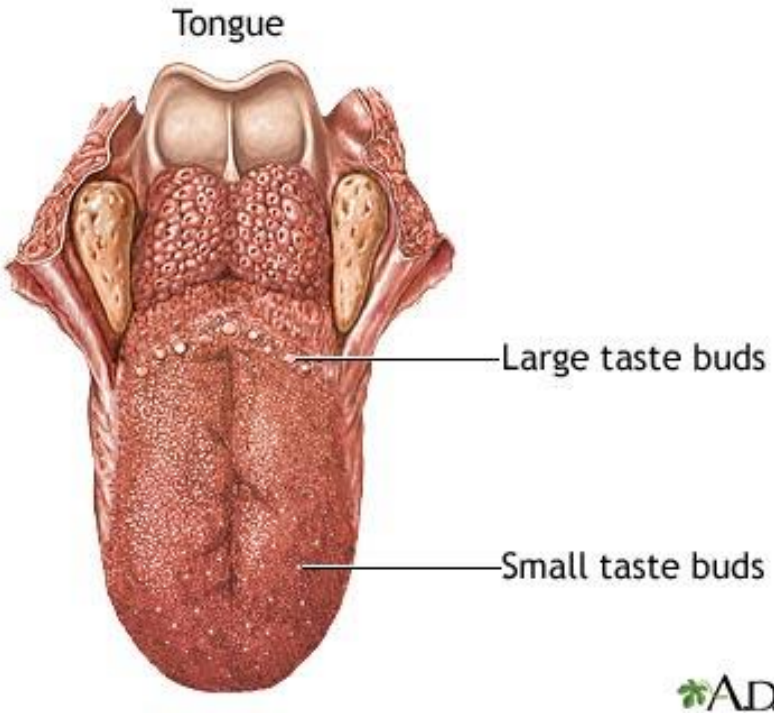
  - **Ear Infection slide show**

Outer and Inner Ear



Taste

- Taste buds (receptors) located in mouth on tongue
- The four types: _____
- Fifth basic type: Umami “brothy and meaty flavors”

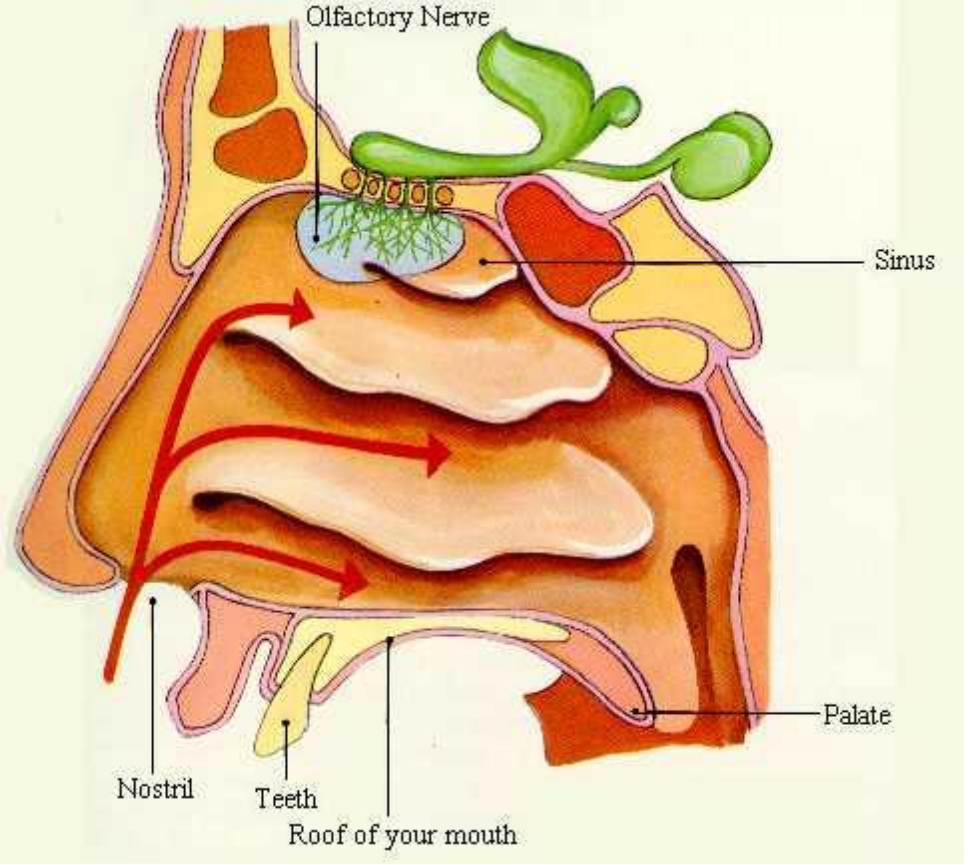


Smell

Receptors gather info;

Info. sent to the brain via _____ in the upper nasal cavity (nasal passages).

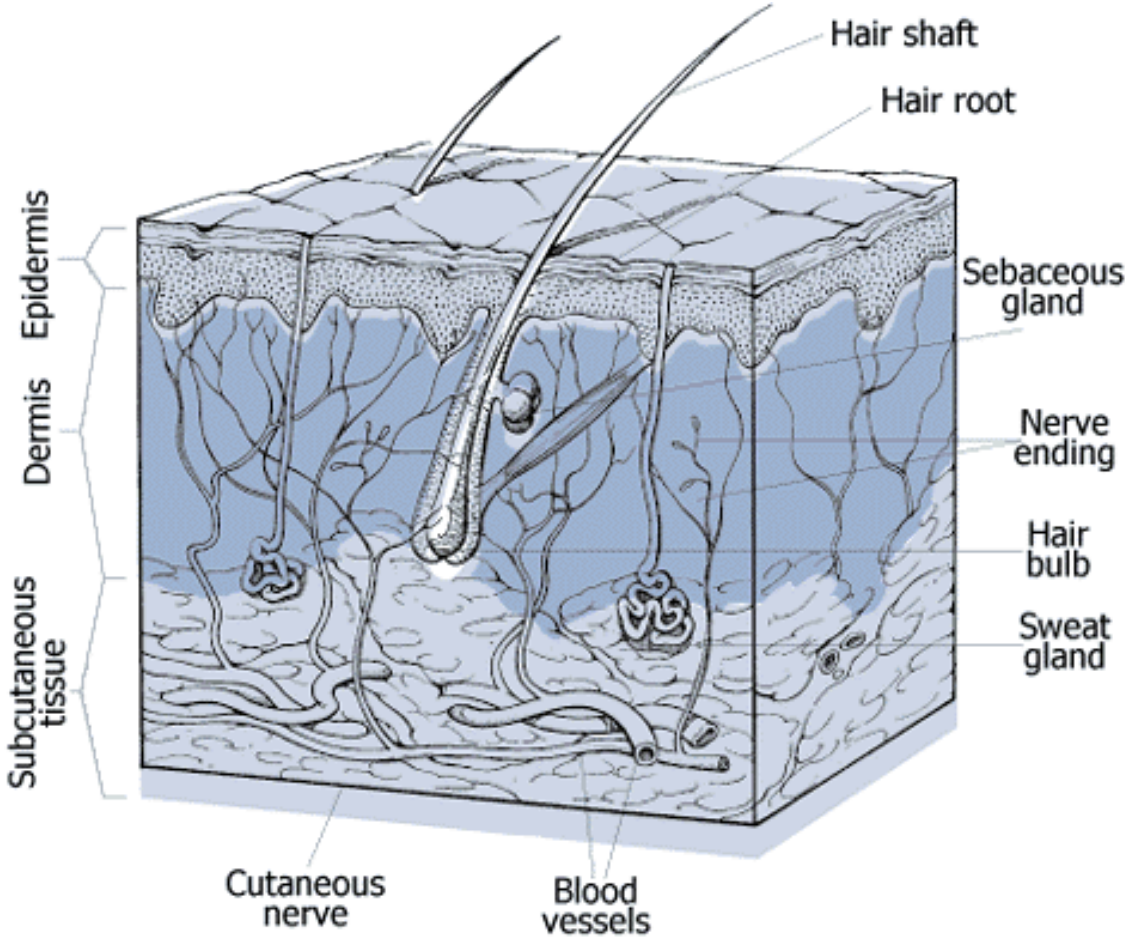
Smells and taste are connected!



Touch

_____

contain *receptors* for texture, pressure, heat, cold, pain



19.4 Drugs and Alcohol

Objectives:

Section 4:

Define the following terms:

- Drug
- Tolerance
- Withdrawal
- Depressant
- anabolic steroid
- drug abuse
- addiction
- stimulant
- hallucinogen
- Alcoholism

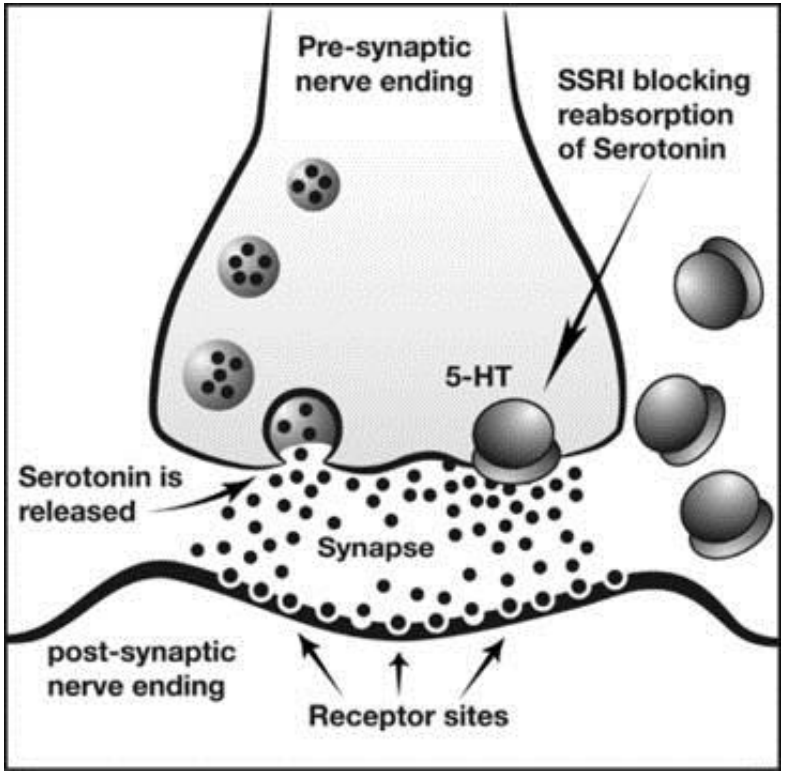
1. Name the immediate and long term effects of drug abuse
2. Identify some commonly abused drugs and how each affects the body
3. Describe how alcohol abuse affects the body
4. Differentiate between prescription and over-the-counter drugs.

Neurotransmitters

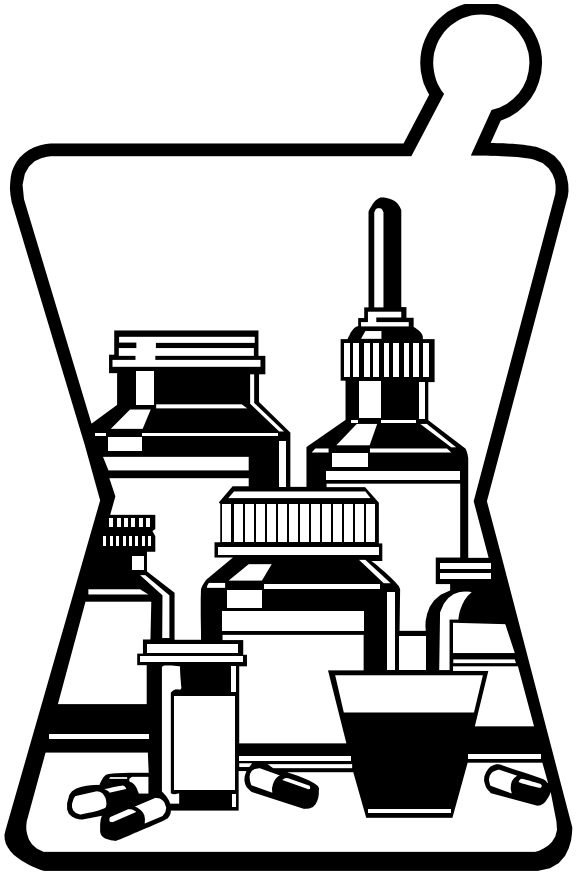
- Neurons communicate impulses by releasing chemicals, _____, into the synaptic cleft.

- Drugs interrupt the signals replacing neurotransmitters

Such as cocaine "hi-jacking" the sites for Dopamine



Define Drugs



Medicines

- drugs that treat

  _____

- 2 classes of medicine
  1. _____
  2. _____

Nervous System Drugs

A. _____

speed up CNS

Cocaine, nicotine, caffeine

B. _____

slow down CNS

Alcohol, heroin

C. _____

alter perception

Ecstasy, Molly, PCP, mushrooms, marijuana

D. _____

Increase muscle and strength

Heart and liver damage

Neurotransmitter	Distribution in the Central Nervous System	Functions Affected	Drugs That Affect It
Dopamine	Midbrain, Ventral tegmental area (VTA), Cerebral cortex, Hypothalamus	Pleasure and reward Movement, Attention, Memory	Cocaine, Methamphetamine, Amphetamine. In addition, virtually all drugs of abuse directly or indirectly augment dopamine in the reward pathway
Serotonin	Midbrain, VTA, Cerebral cortex, Hypothalamus	Mood, Sleep, Sexual desire, Appetite	MDMA (ecstasy), LSD, Cocaine
Norepinephrine	Midbrain, VTA, Cerebral cortex, Hypothalamus	Sensory processing, Movement, Sleep, Mood, Memory, Anxiety	Cocaine, Methamphetamine, Amphetamine
Endogenous opioids (endorphin and enkephalin)	Widely distributed in brain but regions vary in type of receptors, Spinal cord	Analgesia, Sedation, Rate of bodily functions, Mood	Heroin, Morphine, Prescription painkillers (Oxycodone)
Acetylcholine	Hippocampus, Cerebral cortex, Thalamus, Basal ganglia, Cerebellum	Memory, Arousal, Attention, Mood	Nicotine
Endogenous cannabinoids (anandamide)	Cerebral cortex, Hippocampus, Thalamus, Basal ganglia	Movement, Cognition and memory	Marijuana
Glutamate	Widely distributed in brain	Neuron activity (increased rate), Learning, Cognition, Memory	Ketamine, Phencyclidine, Alcohol
Gamma-aminobutyric acid (GABA)	Widely distributed in brain	Neuron activity (slowed), Anxiety, Memory, Anesthesia	Sedatives, Tranquilizers, Alcohol

Drug Misuse vs Drug Abuse

- Misuse
  - improper usage
  - ignoring _____
  - taking more than suggested, etc
- Abuse
  - using illegal drugs or
  - using medicines

_____

_____

Dangers of Abuse

- _____ - need larger amounts to get the same effect
- Dependence (_____) - cannot control drug use
  - Psychological: _____need
  - Physical: _____in order to function
- Withdrawal - _____ effects when an addicted person stops taking a drug
- _____ - taking too much of a drug

- Medical Education Video of the Brain on Drugs