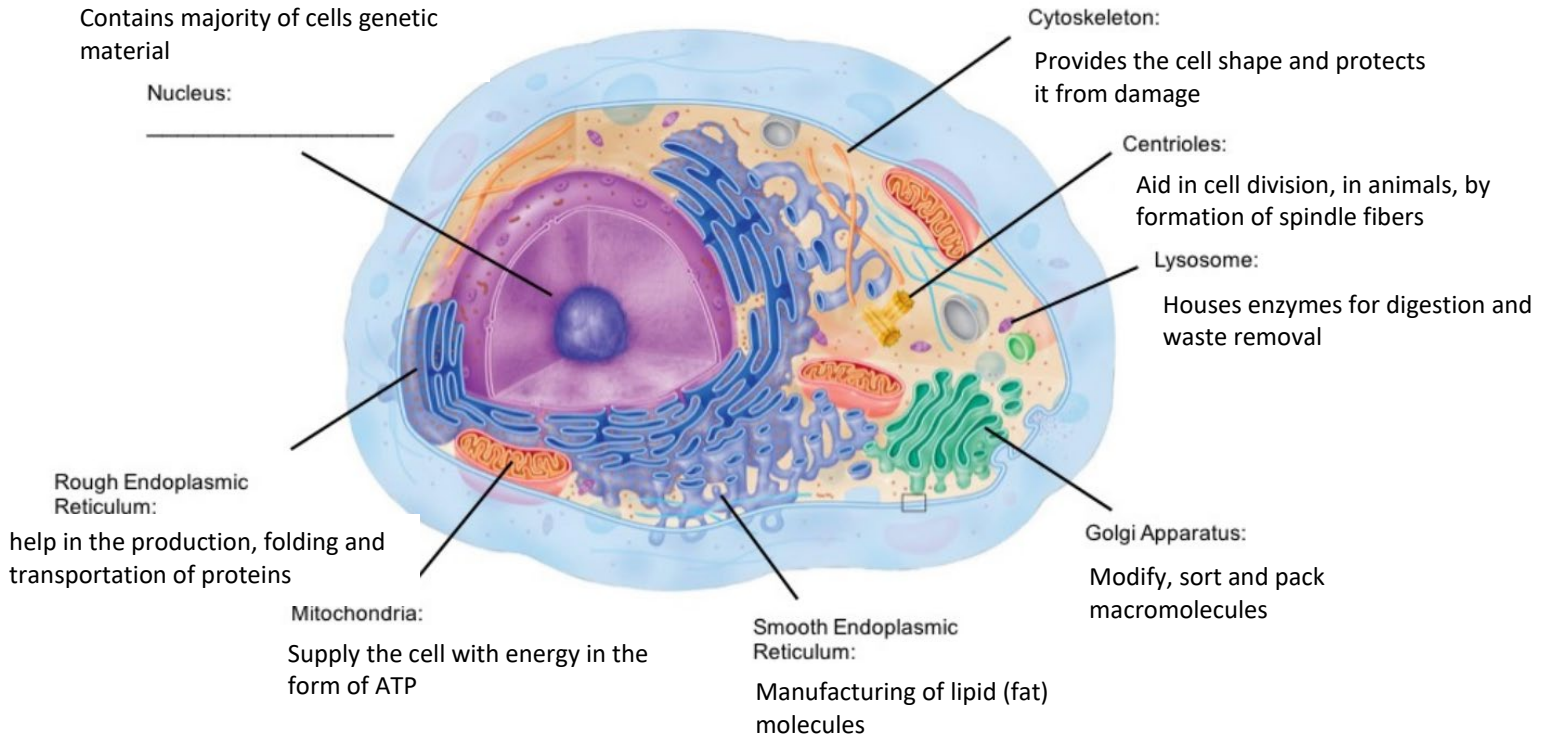


Review Sheet Midterm 1 – Physiology 2130
TA: Greydon Gilmore

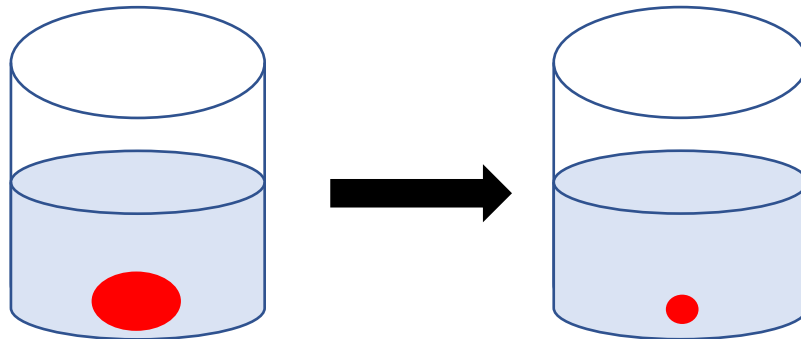
1. Complete the diagram with cell component and function



2. Fill in the following table:

	<u>Simple Diffusion</u>	<u>Diffusion</u>	<u>Facilitated Transport</u>	<u>Active Transport</u>
<u>Selective?</u>	No (still needs to be small & hydrophobic)	Yes	Yes	Yes
<u>Competitive inhibition?</u>	No	No	Yes	Yes
<u>Goes with concentration gradient?</u>	Yes	Yes	Yes	No
<u>ATP required?</u>	No	No	No	Yes

3. You place a red blood cell into a 200 mM BeCl₂ solution, draw the resulting shape of the red blood cell and write the definition of the solution (isotonic, hypertonic, hypotonic).



The solution is Hypertonic

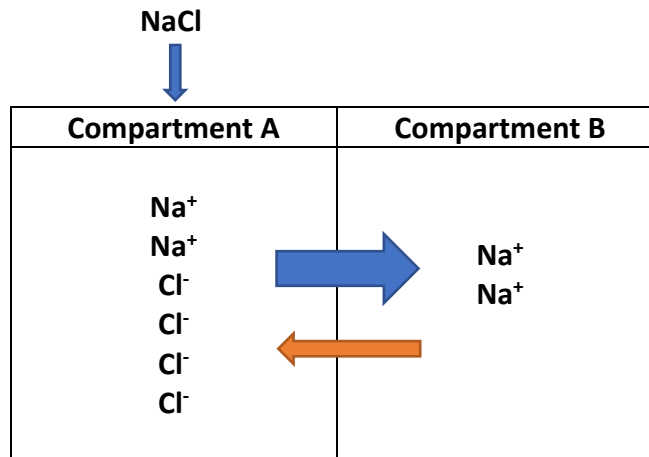
4. The membrane separating compartment A and B is only permeable to water. Once osmotic equilibrium is reached, which compartment will have increased volume? Show your calculation and draw an arrow for flow direction.

	Compartment A		Compartment B	
$= (200 \text{ mM} \times 1 \text{ Na}) + (200 \text{ mM} \times 1 \text{ Cl})$ $= 400 \text{ mOsm}$	200mM NaCl	←	300mM CaCl ₂	$= (200 \text{ mM} \times 1 \text{ Ca}) + (200 \text{ mM} \times 2 \text{ Cl})$ $= 600 \text{ mOsm}$

	Compartment A		Compartment B	
$= (200 \text{ mM} \times 1 \text{ Na}) + (200 \text{ mM} \times 1 \text{ Cl})$ $= 400 \text{ mOsm}$	200mM NaCl		400mM Glucose	Will not dissipate

When thinking about osmolarity there will be no flow of water because they are equal.

5. The membrane separating compartment A and B is only permeable to sodium. You now pour salt (NaCl) into compartment A. What will happen to compartment B? Draw an arrow to indicate potential flow, write any ions that will be present in compartment B and name the main driving force that is occurring here. Are there any other forces present?

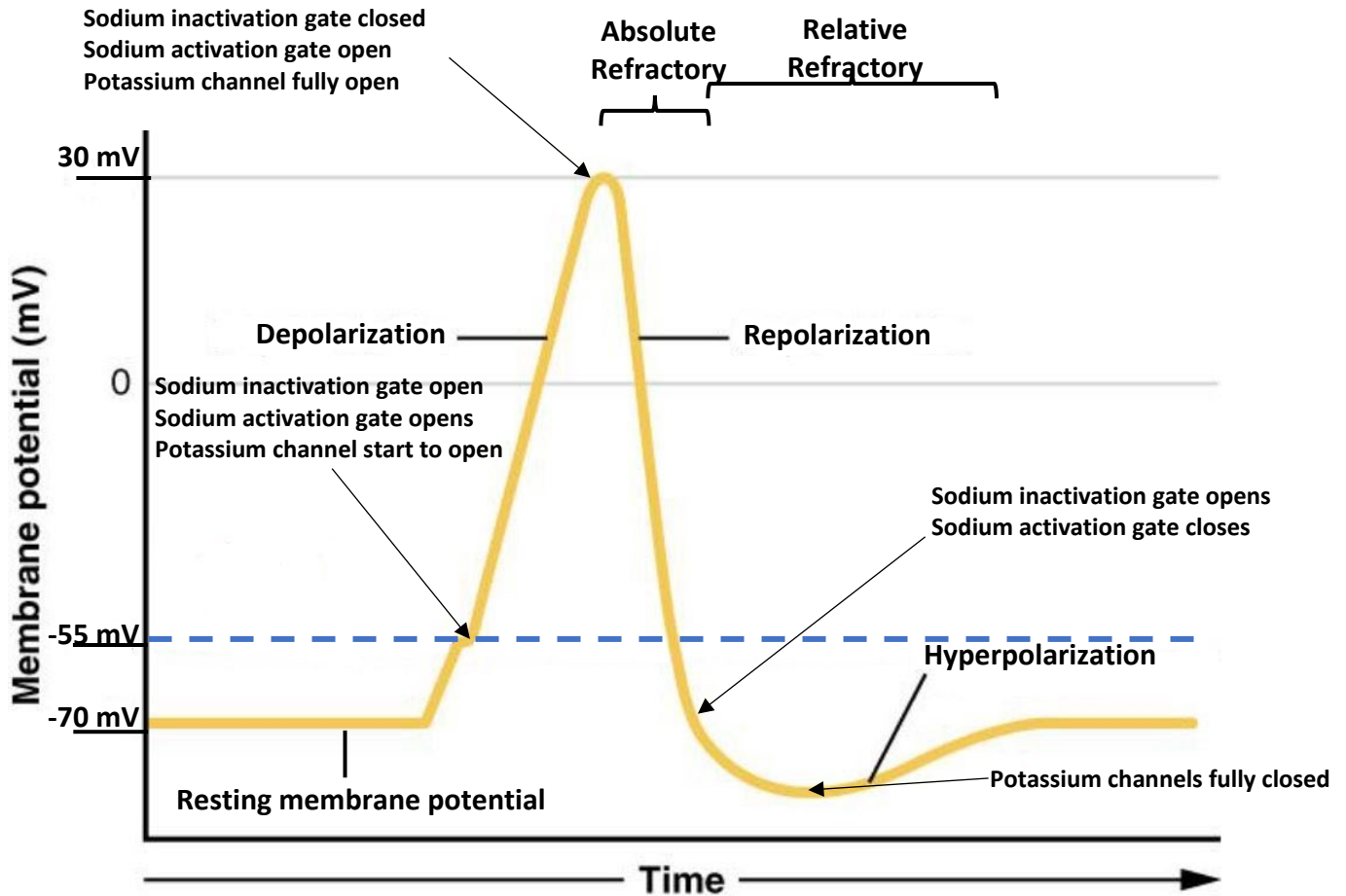


The main force would be the chemical driving force, there will also be an electrical driving force working in the opposite direction. The compartments will reach a state where the two forces are balanced, this is electrochemical equilibrium.

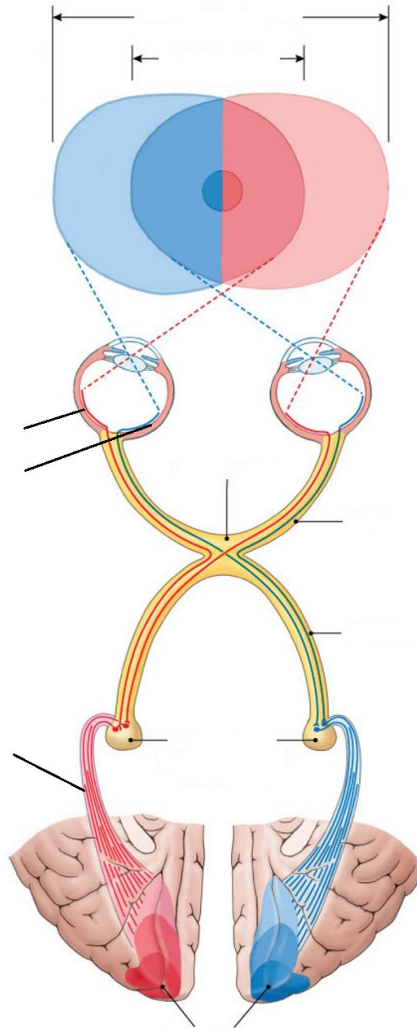
6. Complete the following table:

	Graded Potentials	Action Potentials
Where to they occur?	Occur at dendrites/somas	Occur at axon hillock
Type of channels?	Caused by mechanical or chemical-gated channels	Caused by voltage-gated channels
Type of polarization?	Can be a depolarization or hyperpolarization	Always a depolarization
Amplitude constant?	Amplitude of potential is directly proportional to stimulus strength	All or nothing–Amplitude of potential is constant no matter the stimulus strength
Distance travelled?	Travel short distances	Travel long distances

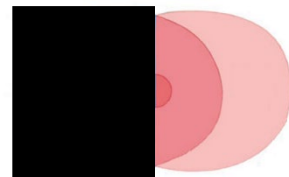
7. Write the main phases of an action potential. Using arrows, where are the sodium and potassium channels open/closed. Label the positions for the different refractory phases. Draw in where the threshold would be, also include the voltage for RMP and the peak of the action potential.



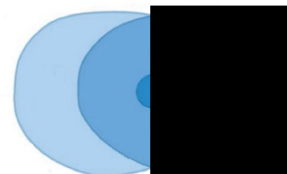
8. Fill in the following diagram. Answer the subsequent questions.



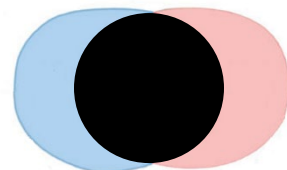
A. Draw a lesion to the right optic tract, then shade in the visual field area that would be affected.



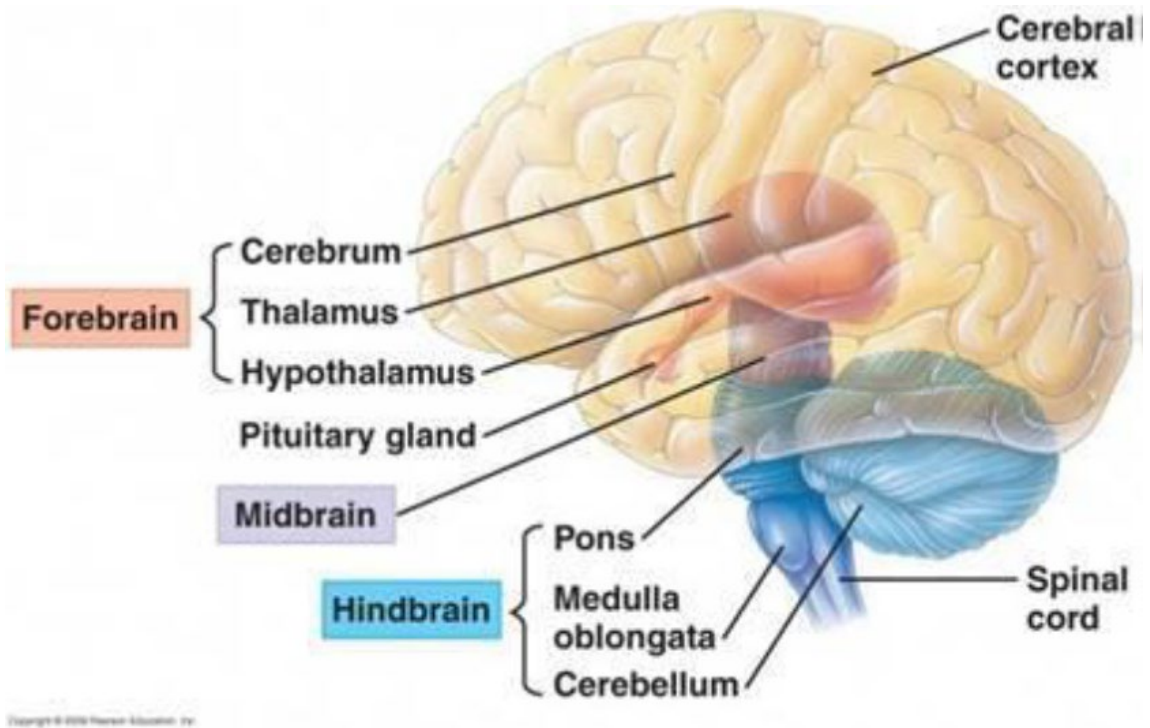
B. Draw a lesion to the left LGN, then shade in the visual field area that would be affected.



C. Draw a lesion to the lateral aspects of the optic chiasm. However, the lesion spared the medial aspect. Shade in the visual field area that would be affected.



9. Fill in the following diagram.



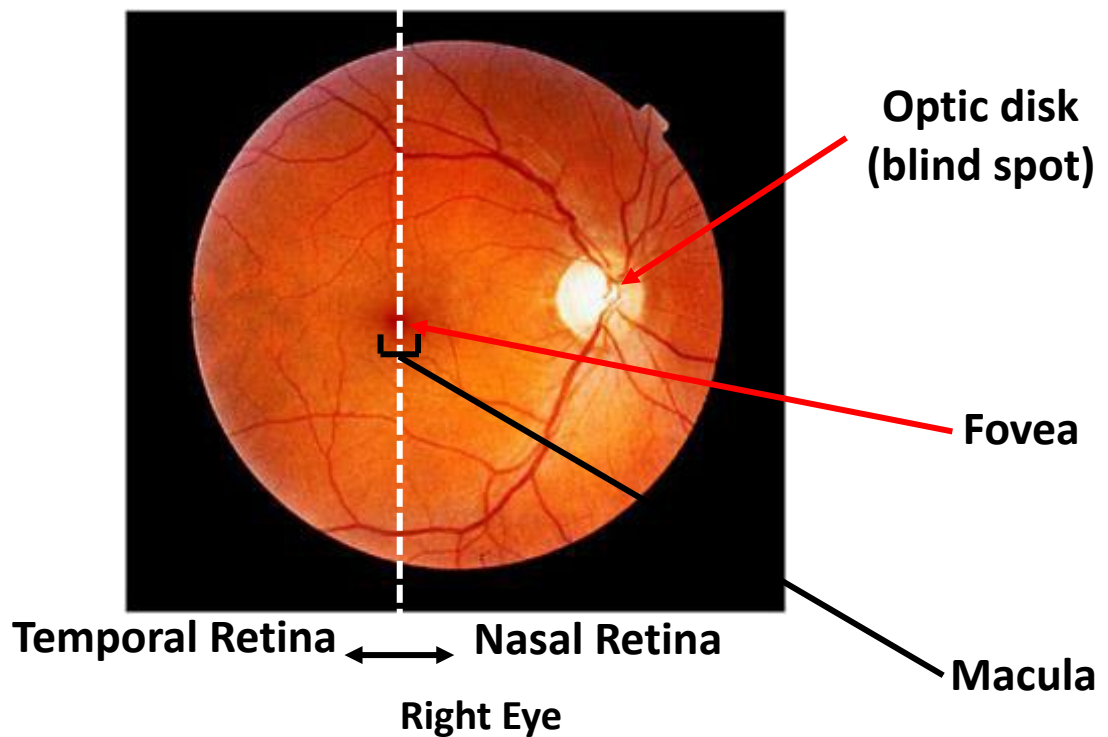
10. Fill in the following table about brain tissue.

	White Matter	Gray Matter
Colour	White	Gray
Components	Axons	Cell bodies, dendrites and axon terminals
Myelin present	Yes, gives white appearance	No
Function	For communication between grey matter sites	Processing of information

11. Fill in the following table on mechanoreceptors.

Receptor	Location	Adaption Rate	Receptive Field Size
Merkel's Disks	Epidermis-Dermis Border	Slow	Small
Meissner's corpuscles	Dermis (Surface)	Rapid	Small
Ruffini's endings	Dermis (Deep)	Slow	Large
Pacinian corpuscles	Dermis (Deep)	Rapid	Large

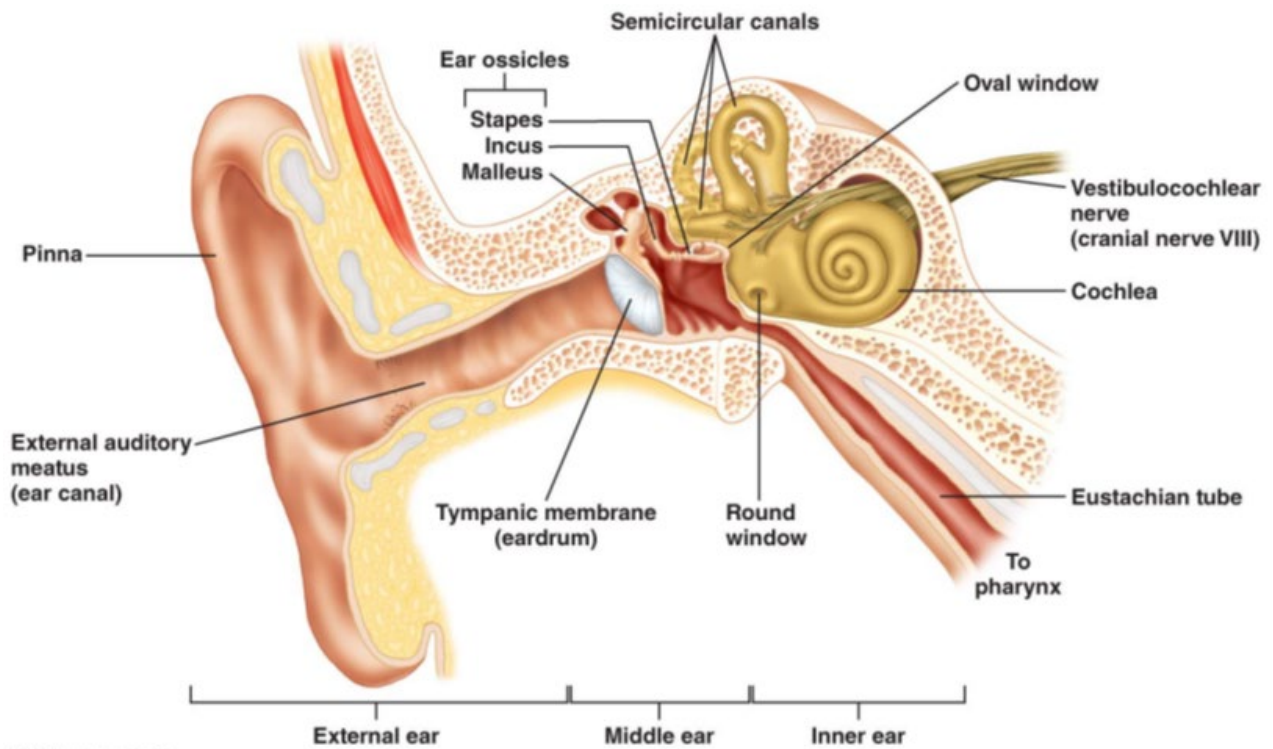
12. Label the following diagram, indicating the side of the body the eye is on and where the different parts of the retina are.



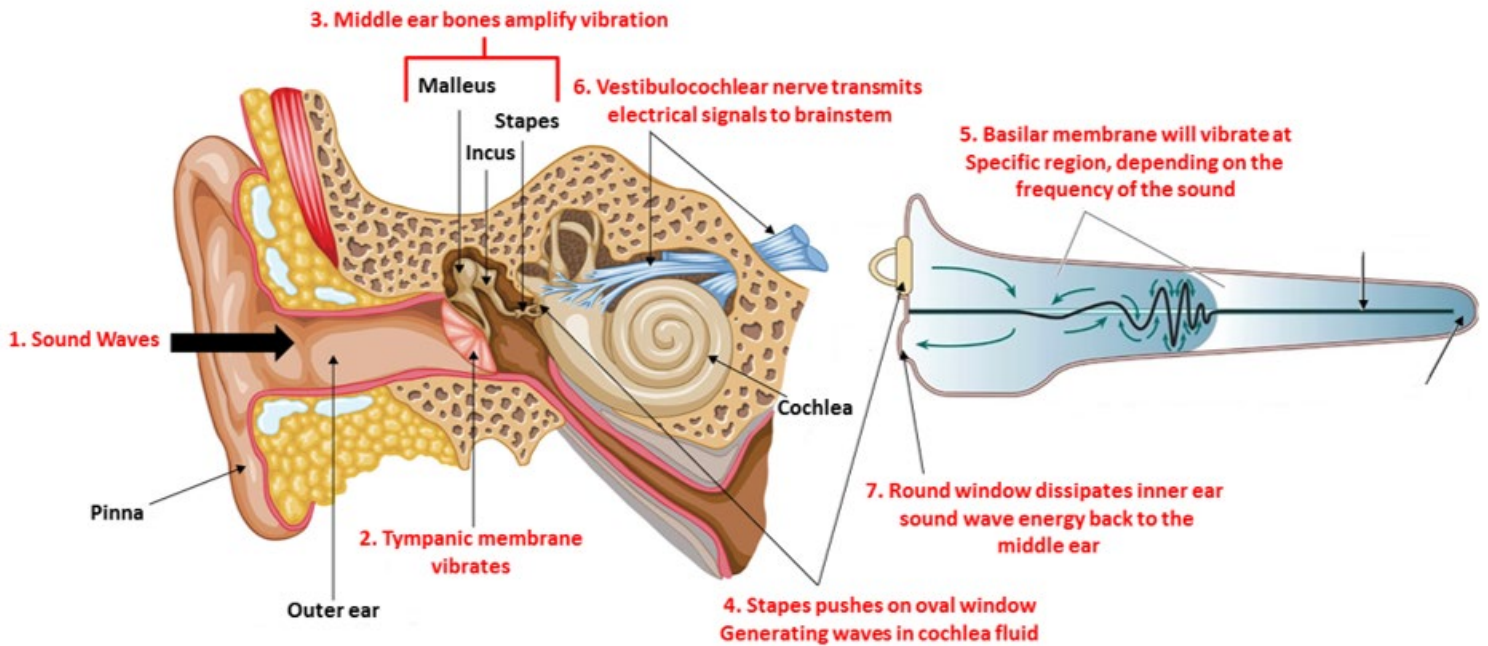
13. Fill in the following table on photoreceptors.

Feature	Rods	Cones
Sensitive to...	White/Black	Color
Lighting conditions...	Dim light – Scotopic vision	Daylight – Photopic vision
Located	Around retina	Only in fovea
Amount	Many (120 million/retina)	Few (5 million/retina)

14. Fill in the following diagram of the ear.



15. Fill in the diagram with the steps of how sound travels through the ear. Do not worry about relabeling the parts, just input the information at each red number.



16. Fill in the following table about hormones

Parameter	Peptide/Protein	Steroid	Amine	
			Hydrophilic	Hydrophobic
Examples	Hormones that end in "-in"	Hormones that end in "-ol" or "-one"	Epinephrine	Thyroid Hormones
Precursor	Amino acids	Cholesterol	Tyrosine	Tyrosine
Solubility	Hydrophilic	Lipophilic	Hydrophilic	Hydrophobic
Blood transport	Dissolves	Bound to protein	Dissolves	Carrier protein
Receptor location	Cell surface	Intracellular	Extracellular	Intracellular
Speed of action	Fast	Slow	Fast	Slow