Cogs 17: Section

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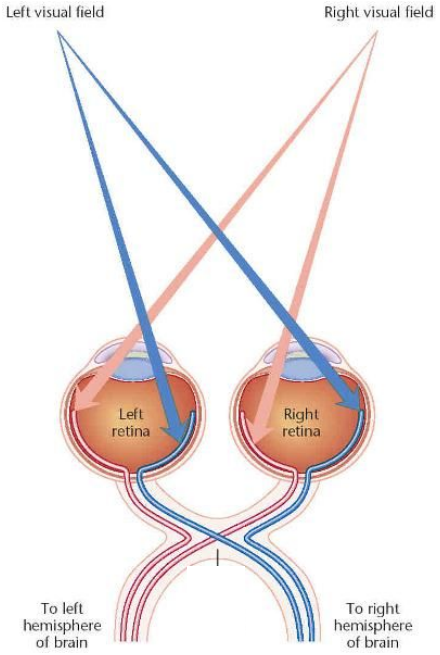
7.18.17

Vision Pt. 2

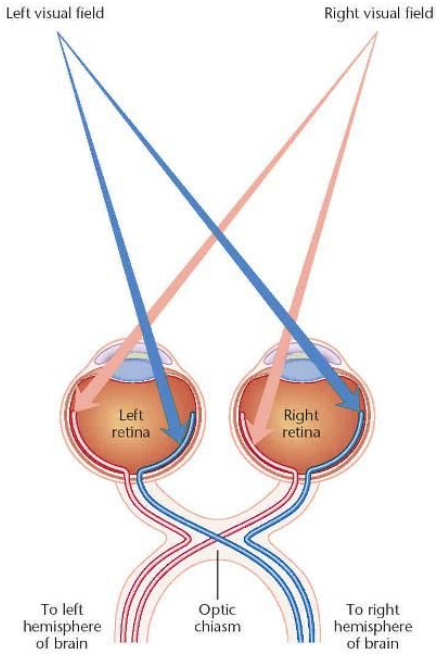
Visual Fields

- Visual fields demonstrate a _____lateral pattern
- The point at which the optic nerves cross is called the _____



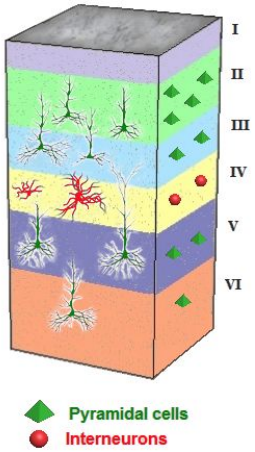
Visual Fields

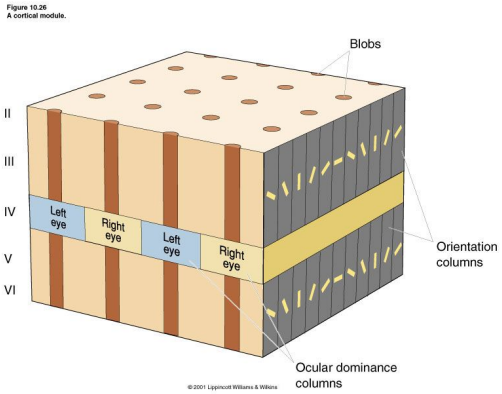
- Visual fields demonstrate a **contra**lateral pattern
- The point at which the optic nerves cross is called the **optic chiasm**



Columnar Organization

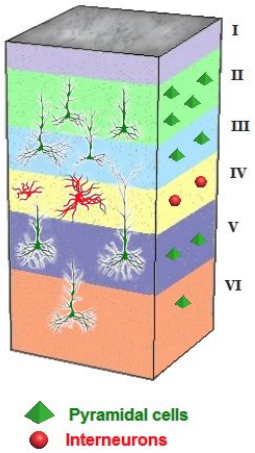
- All cells within a column show a _____ stimulus
- Hypercolumns have the same _____

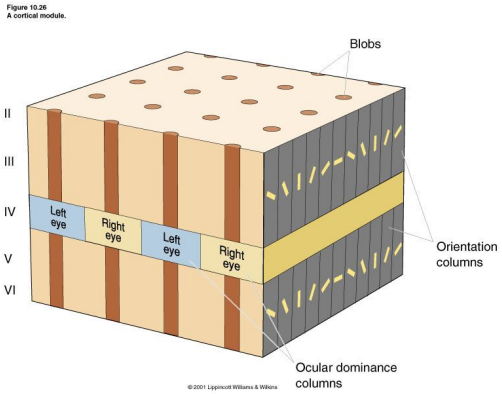




Columnar Organization

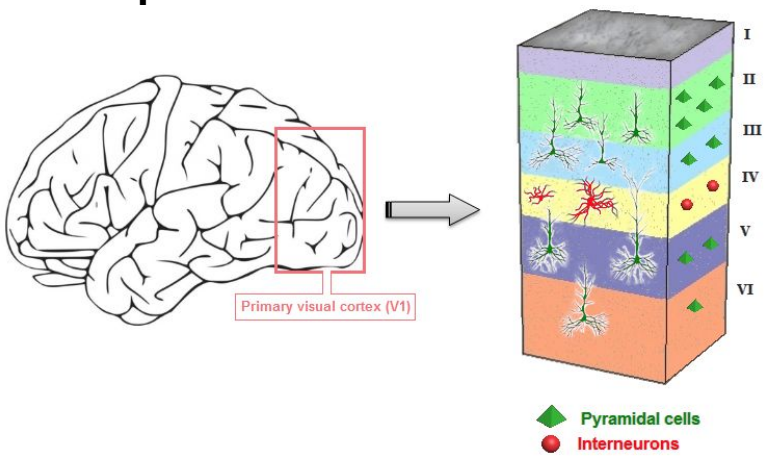
- All cells within a column show a **preferred** stimulus
- Hypercolumns have the same **receptive field**





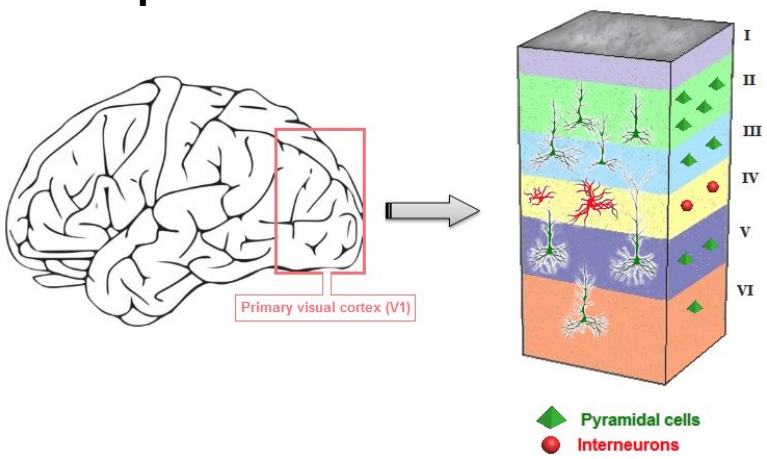
Which layer receives input from the LGN?

- Layer ____
- LGN stands for...



Which layer receives input from the LGN?

- Layer **4**
- LGN stands for **Lateral Geniculate Nucleus**



Explain the Ventral Visual Pathway

- The ventral pathway is the _____/_____ pathway, also known as the magnocellular/parvocellular pathway.
- It begins in the rods/cones in the _____ and has small/large receptive fields
- Ends at the inferior _____ cortex

Explain the Ventral Visual Pathway

- The ventral pathway is the **“who”**/**“what”** pathway, also known as the magnocellular/**parvocellular** pathway.
- It begins in the rods/**cones** in the **fovea** and has **small**/large receptive fields
- Ends at the inferior **temporal** cortex

What are the 3 cells of the visual cortex?

What are the 3 cells of the visual cortex?

- Simple cell
- Complex cell
- Combinations

What are the 3 cells of the visual cortex?

- Simple cell - **sensitive to particular line orientations, V1**
- Complex cell - **sensitive to moving lines of a particular orientation, V2**
- Combinations - **sensitive to sine wave gradients, V3**

How do we know these 2 are Obama?

What is the region of the brain that recognizes faces?

- _____ gyrus

- The inability to recognize faces is called...

What is the region of the brain that recognizes faces?

- **Fusiform** gyrus

- The inability to recognize faces is called **prosopagnosia**

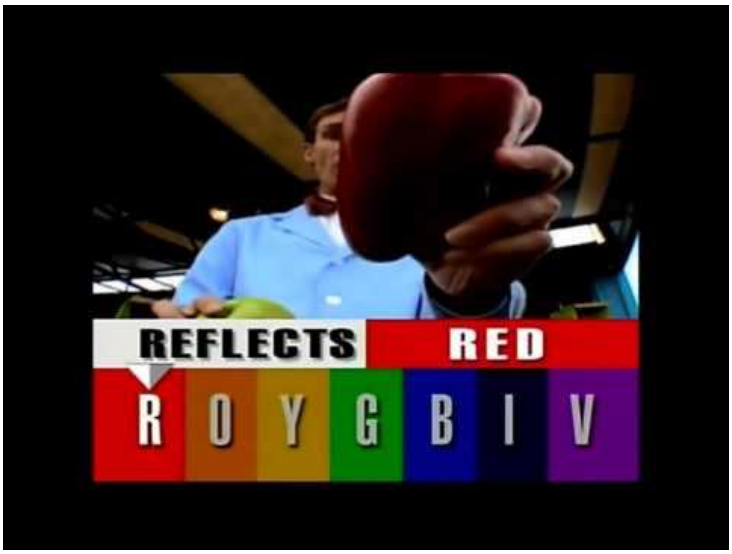
Explain the Dorsal Visual Pathway

- The ventral pathway is the _____/_____ pathway, also known as the magnocellular/parvocellular pathway.
- It begins in the in the _____ of the retina and has small/large receptive fields
- Most cells lead to _____ and medial _____ temporal cortex

Explain the Dorsal Visual Pathway

- The ventral pathway is the **“where”/”how”** pathway, also known as the magnocellular/parvocellular pathway.
- It begins in the in the **periphery** of the retina and has small/**large** receptive fields
- Most cells lead to **medial temporal** and medial **superior** temporal cortex

Color perception



Audition

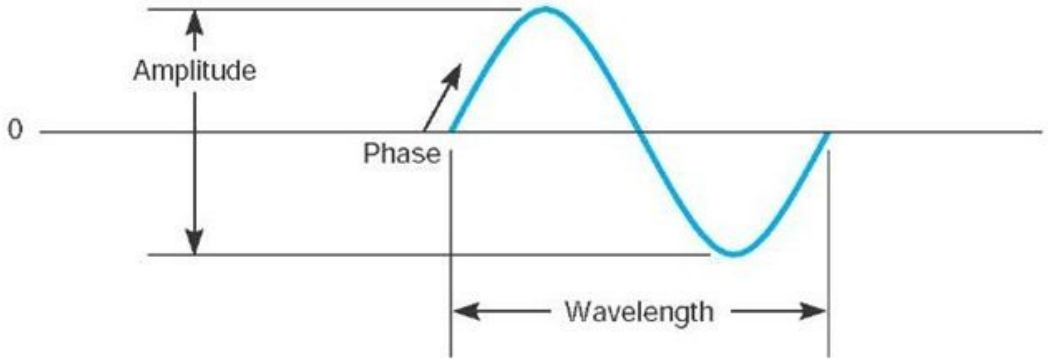
Label these definitions

- The speed at which molecules of air oscillate.
- The distance a molecule travels in oscillation.
- The place in the cycle of condensation and rarefaction.

Label these definitions

- The speed at which molecules of air oscillate. **frequency**
- The distance a molecule travels in oscillation. **amplitude**
- The place in the cycle of condensation and rarefaction. **phase**

Soundwaves



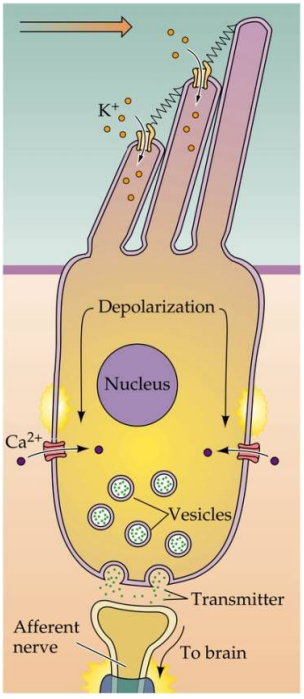
Explain transduction in hair cells

- The hair cells of the ear are called...
- Cilia are asymmetrical in height. When bent toward the short/long cilia K+/Na+ gates open and leads to more positive/negative ions entering the cell
- When polarity changes enough _____ gates open, leading to the release of neurotransmitter, a.k.a. _____.
- The more the cilia are bent, the more neurotransmitter is released. This is called a _____.

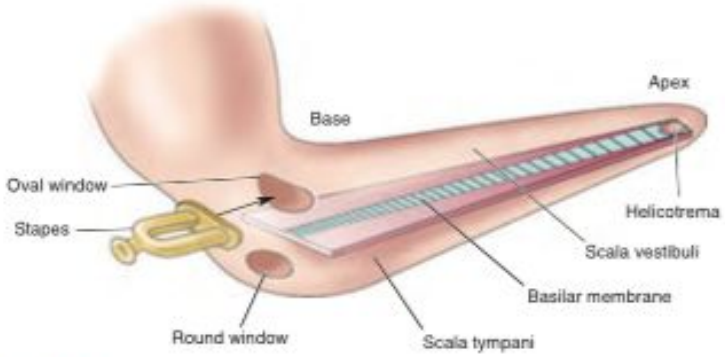
Explain transduction in hair cells

- The hair cells of the ear are called **cilia**
- Cilia are asymmetrical in height. When bent toward the short/**long** cilia **K+**/Na+ gates open and leads to more positive/negative ions entering the cell
- When polarity changes enough **Ca++** gates open, leading to the release of neurotransmitter, a.k.a. **exocytosis**.
- The more the cilia are bent, the more neurotransmitter is released. This is called a **graded potential**.

Cilia

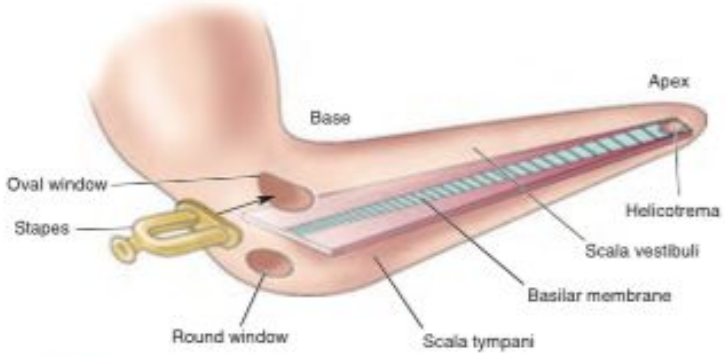


What is this structure?



What is this structure?

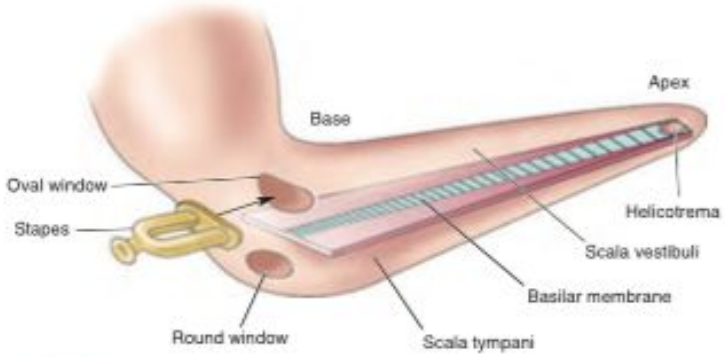
Basilar membrane



What is this structure?

Basilar membrane

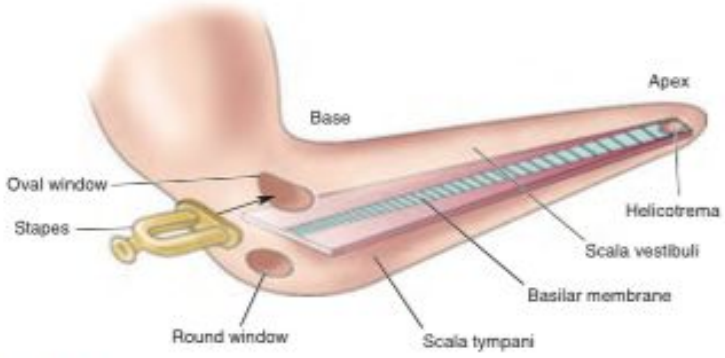
- The ____ is narrow and stiff and resonates at a high/low frequency
- The ____ is wide and floppy and resonates at a high/low frequency



What is this structure?

Basilar membrane

- The **base** is narrow and stiff and resonates at a **high**/low frequency
- The **apex** is wide and floppy and resonates at a high/**low** frequency



Why do we hear a difference in the notes of a song?

- The frequency theory of hearing states ...
- This works because the entire _____ membrane vibrates at different rates, which causes _____ impulses to transmit at different rates.
- Lower notes vibrate slower/faster speeds while higher notes vibrate at slower/faster speeds.
- As pitch increases, nerve impulses of the same frequency are sent to the auditory nerve. (i.e. a 700Hz tone produces _____ neural impulses per second).
- This is known as _____ coding.

Why do we hear a difference in the notes of a song?

- The frequency theory of hearing states **the frequency of the auditory nerve's impulses corresponds to frequency of tone**.
- This works because the entire **basilar** membrane vibrates at different rates, which causes **neural** impulses to transmit at different rates.
- Lower notes vibrate **slower**/faster speeds while higher notes vibrate at slower/**faster** speeds.
- As pitch increases, nerve impulses of the same frequency are sent to the auditory nerve. (i.e. a 700Hz tone produces **700** neural impulses per second).
- This is known as **temporal** coding.