

Week 4 Presentation: The Neural Machinery of Vision (Chapters 3 & 4)

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Introduction:

Vision begins with light striking the retina, but “seeing” occurs in the brain. This topic explores the transformation of light energy into neural signals and how the visual cortex (V1 and beyond) begins to feature-detect the world. It covers the receptive fields, the lateral geniculate nucleus (LGN), and the architectural organization of the visual cortex, laying the biological groundwork for all visual perception.

Brainstorming Questions:

- 1. Hidden Figures & The Brain’s Chef:** Describe a time you tried to find a specific object in a messy room or played “Where’s Waldo?”. Explain, as if you were talking to, your grandma how your brain’s “receptive fields” act like sous-chefs chopping up the visual scene into lines and edges to help you find what you’re looking for.
- 2. The Spinning World:** Spin around until you’re dizzy, then stop. The world keeps spinning! Use this dizzy experience to explain to a 6-year-old why, normally, our brain does a magic trick to keep the world stable and upright, even though the image in our eyes is actually upside-down and shaky.
- 3. The Broken TV Analogy:** Close your eyes and try to identify an object (like a key) just by touch. Now, imagine seeing an object moving but having no color. Explain this “selective blindness” (like achromatopsia) to a child using an analogy of a broken TV that has sound but no picture, helping them understand how different brain parts do different jobs.

Recommended Readings:

- Goldstein, E. B., & Cacciamani, L. (2022). Chapter 3: The Eye and Retina. In *Sensation and perception* (11th ed.). Cengage.

- Goldstein, E. B., & Cacciamani, L. (2022). Chapter 4: The Visual Cortex and Beyond. In *Sensation and perception* (11th ed.). Cengage.