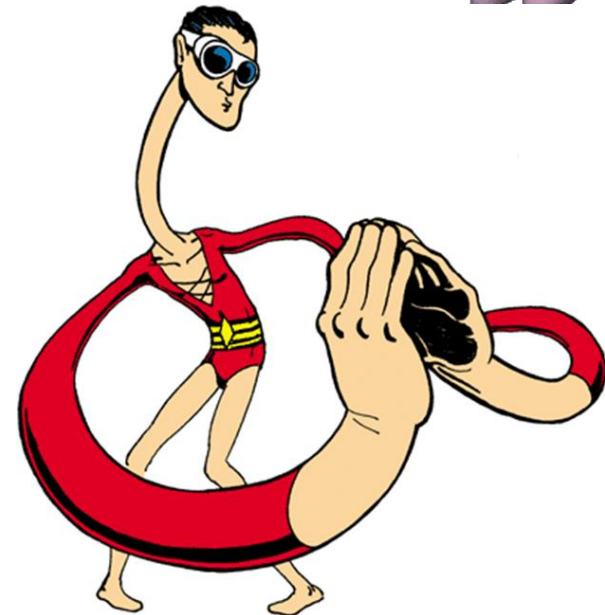
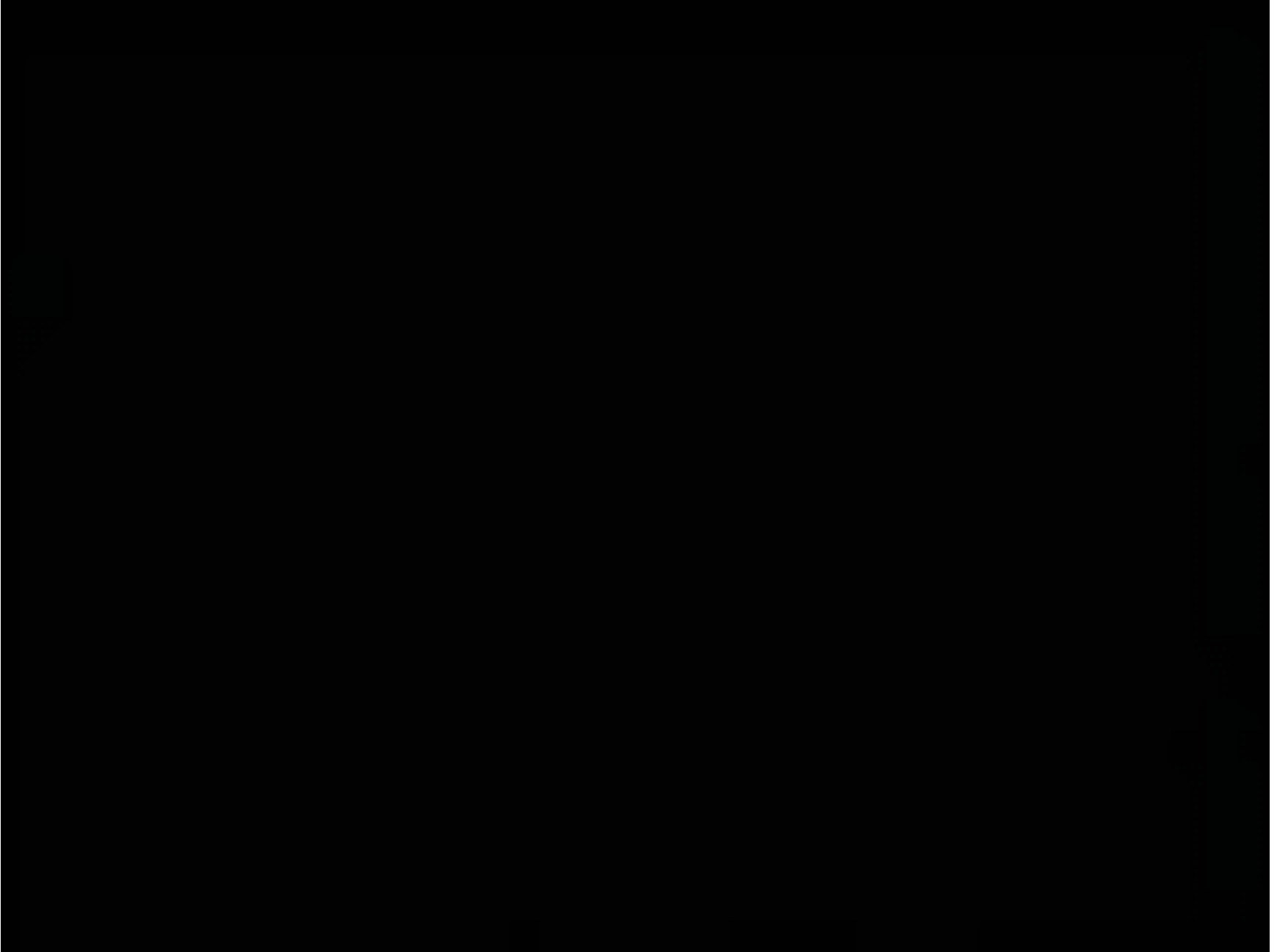


# Brain Plasticity

- The ability for our brains to form new connections after the neurons are damaged.
- The younger you are, the more plastic your brain is.
- Can occur during normal brain development when the immature brain first begins to process sensory information through adulthood.
- Can occur as an adaptive mechanism to compensate for lost function and/or to maximize remaining functions after a brain injury.



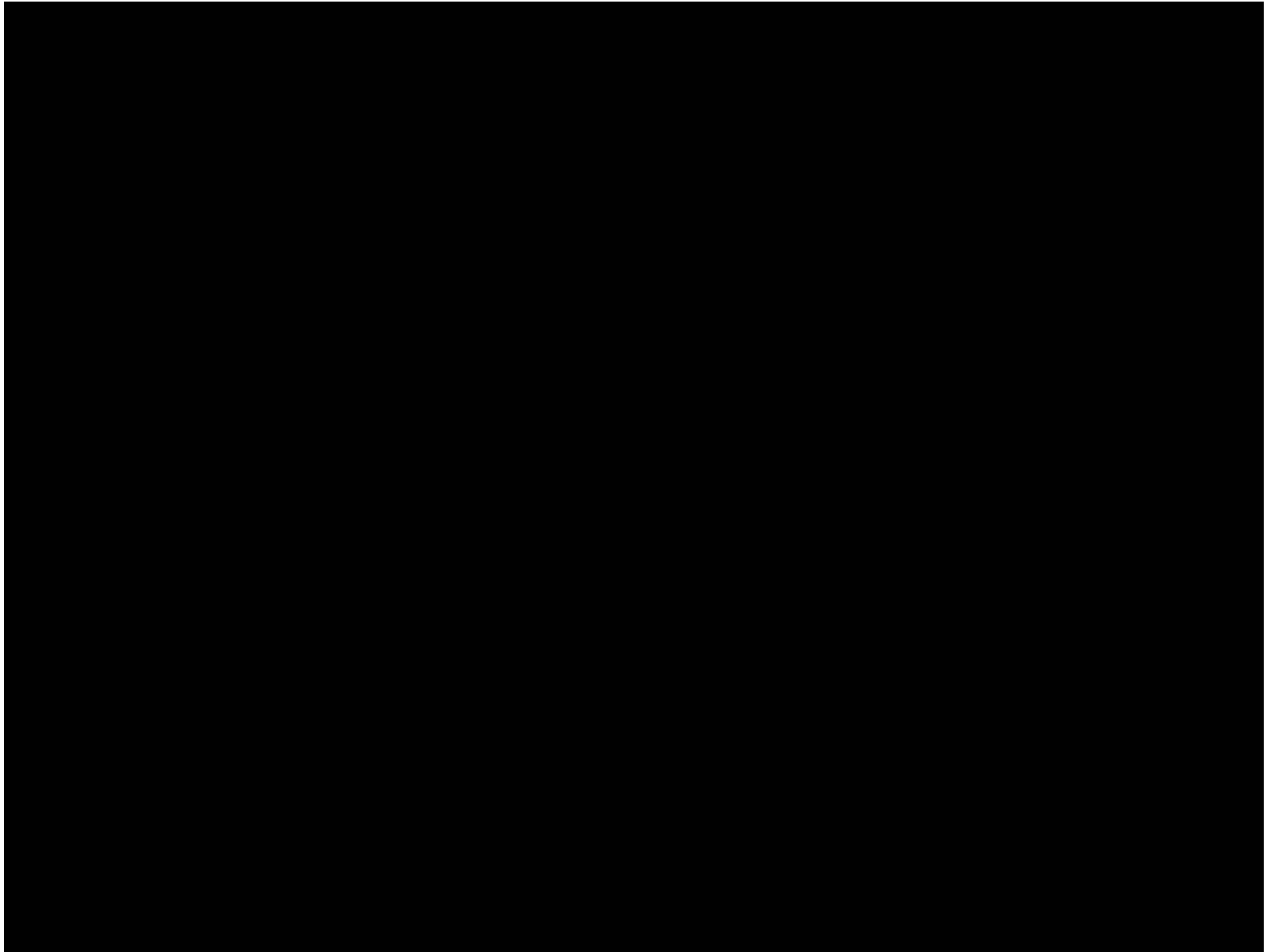
# Brain Plasticity



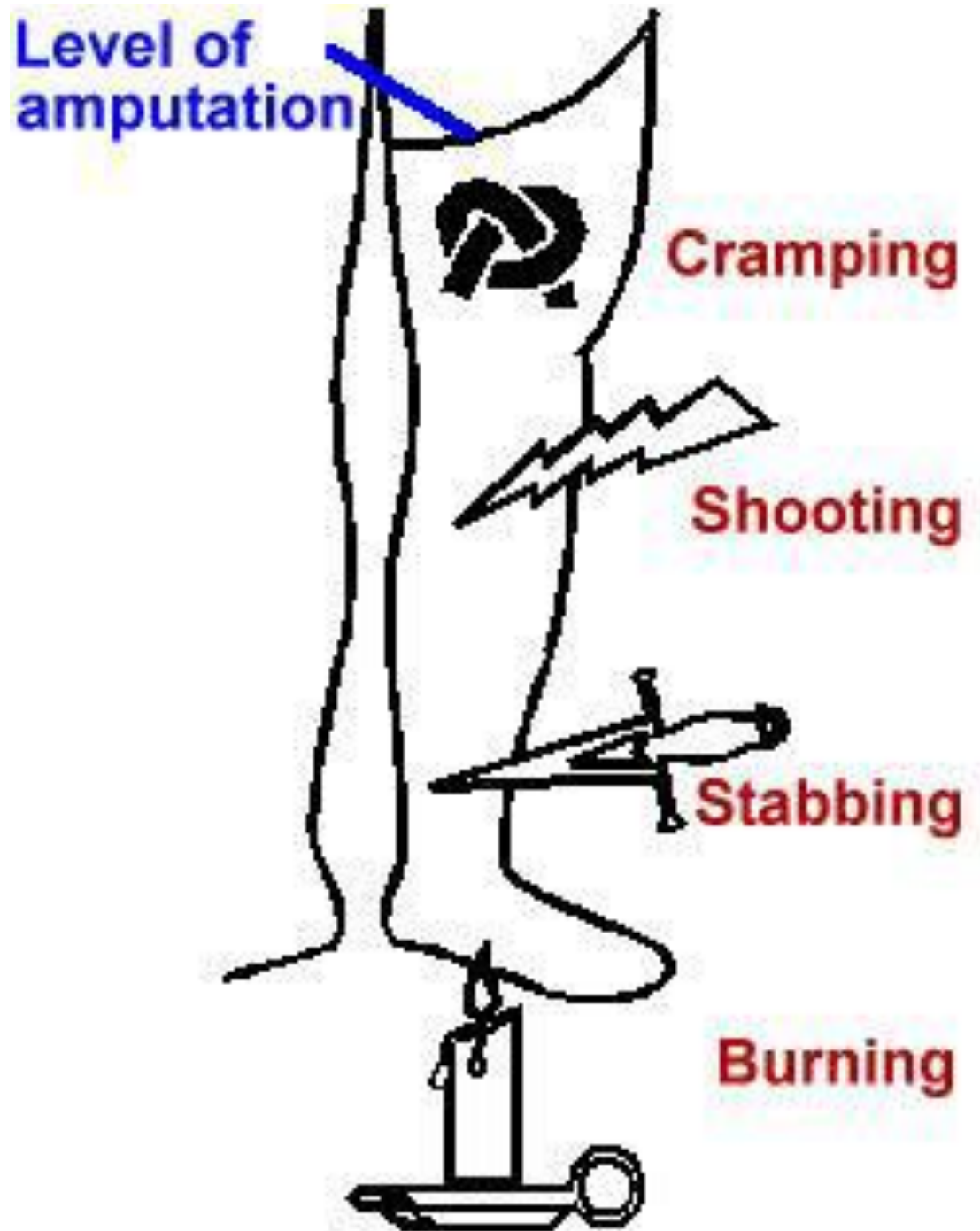
# Phantom Sensations

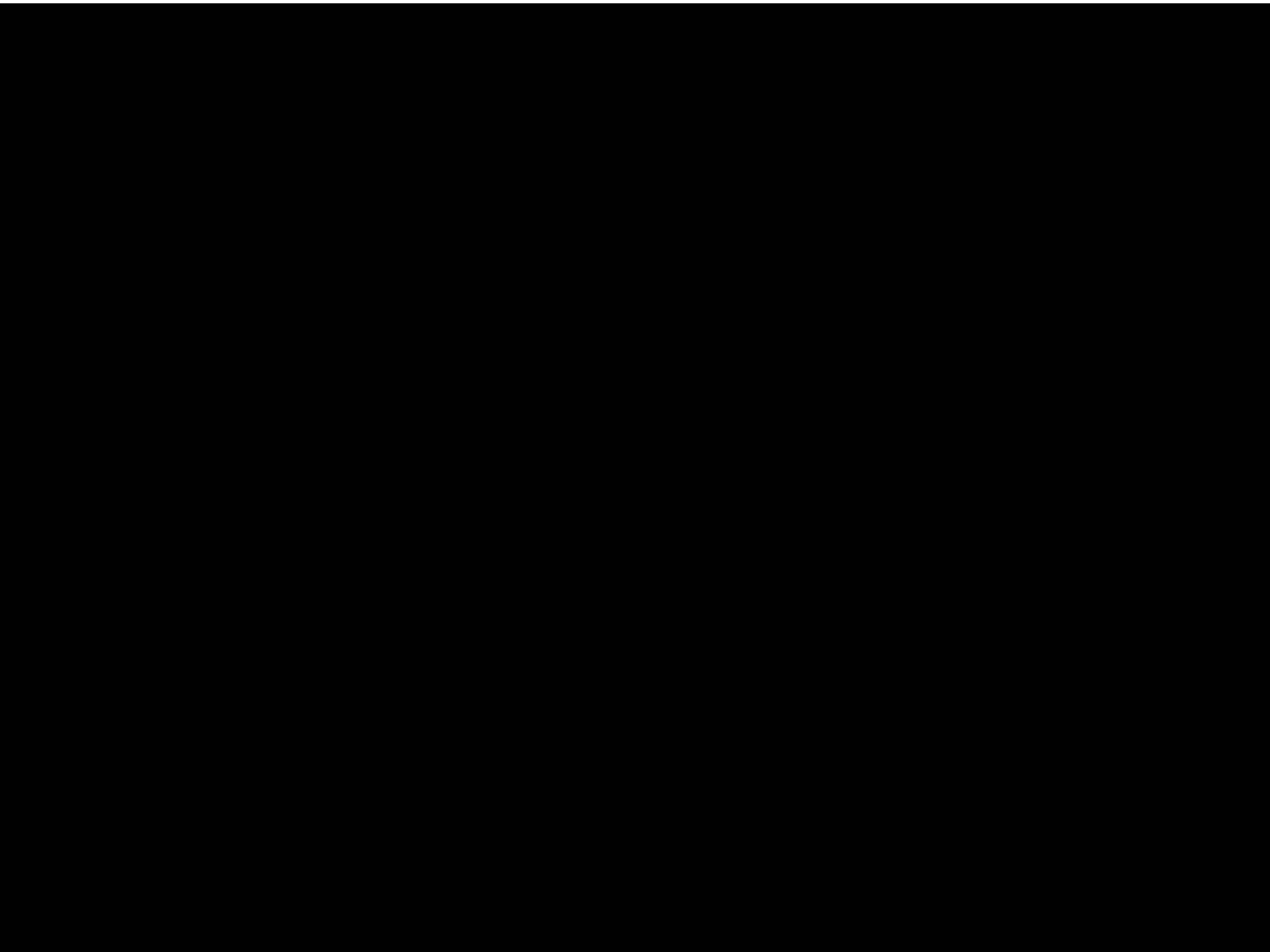
Resembles the somatosensory experience of the physical limb before amputation, including warmth, itching, sense of position and mild squeezing.

# Phantom Sensations



Phantom pains:  
when phantom  
sensations  
become  
intense enough  
for the  
amputee to  
define them  
as painful.





# Incidence

- 80% of these individuals feel pain in the missing limb. Sensations are more common.
- Generally begins immediately after the arm or leg has been removed and it may last for years.
- In over half of the cases the phantom sensations decrease gradually.
- Not related to age, sex, location of the amputation, or reason for the amputation (eg. Trauma vs. disease.)





# Vision

- Right side of your brain controls your Left body functions
- Left side of your brain controls your Right body functions
- The Eye is not so easy...

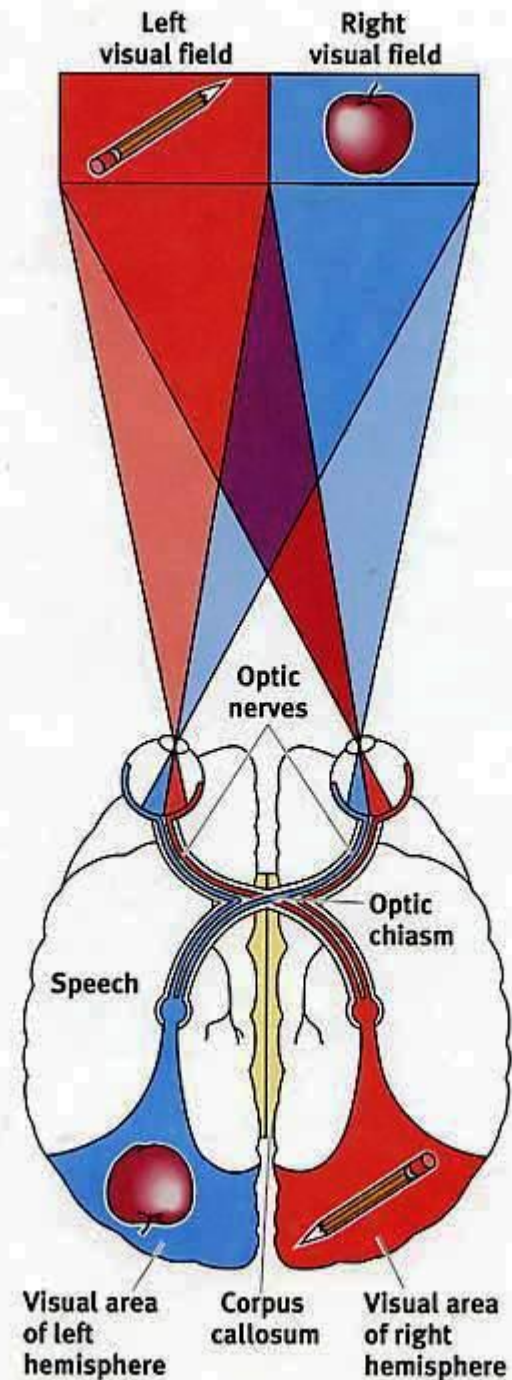
# Vision

- Each eyeball is divided into 2 parts

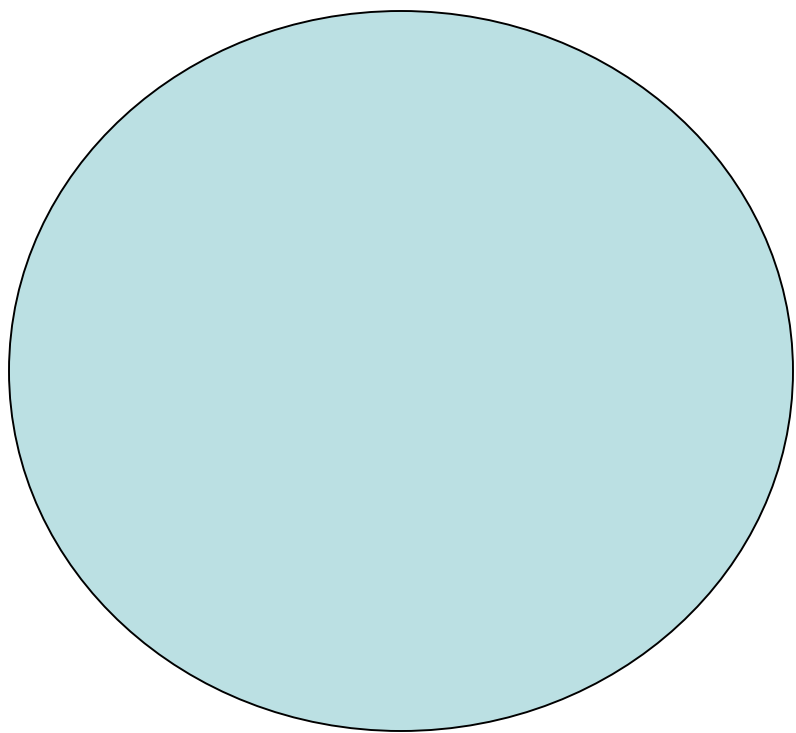
-Right Visual Field

-Left Visual Field

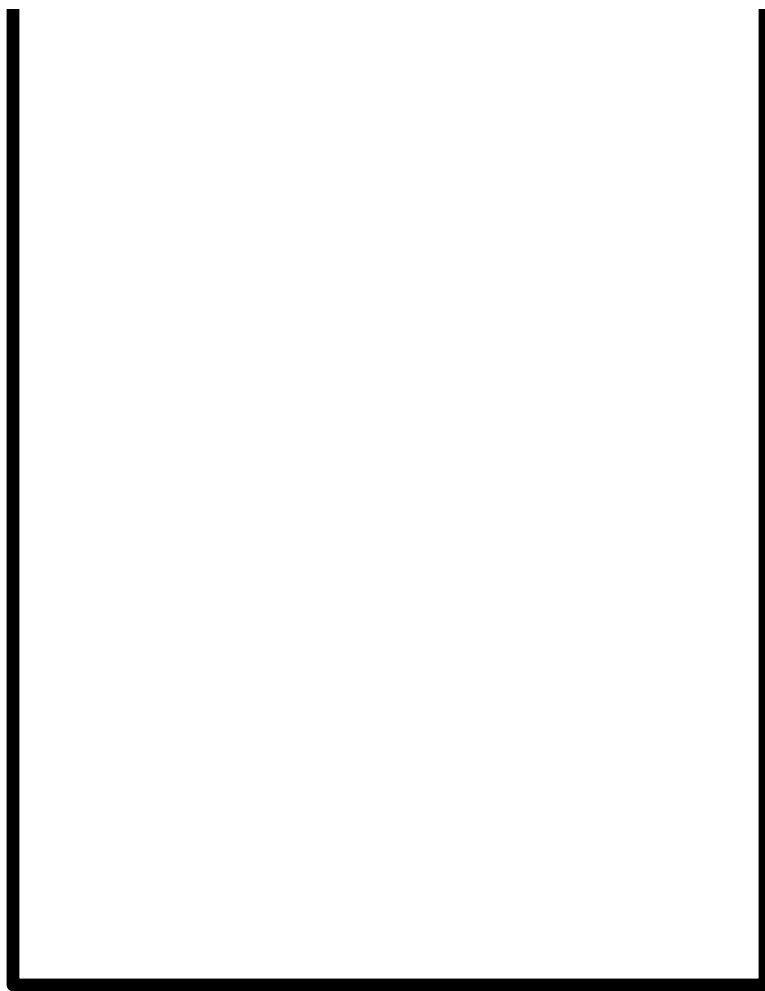
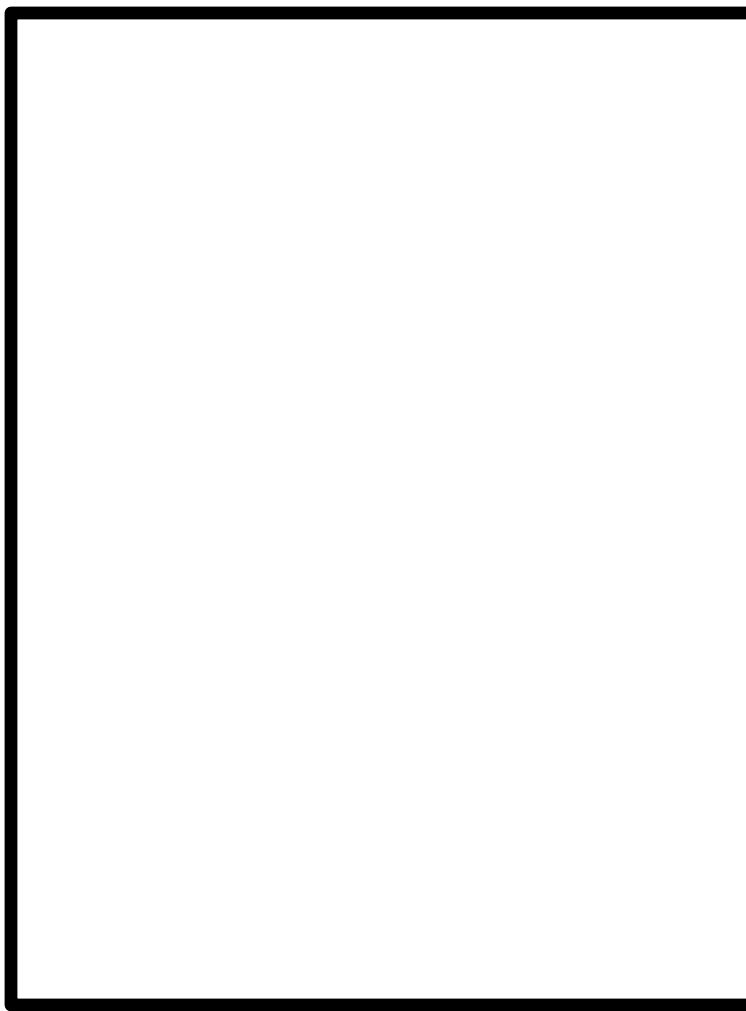
- Right Hemisphere receives visual info from **LVF** only
- Left Hemisphere receives visual info from **RVF** only



- EACH OF THE FOLLOWING TWO SLIDES CONTAIN TWO OBJECTS.
- OPEN YOUR NOTEBOOK TO TWO NEW, CLEAR PAGES.
- YOU WILL NEED TWO WRITING UTENSILS. IF YOU NEED AN EXTRA, I WILL LOAN YOU ONE.
- WHEN YOU SEE THE IMAGES, TRY TO DRAW THEM BOTH SIMULTANEOUSLY, ONE ON EACH PAPER.

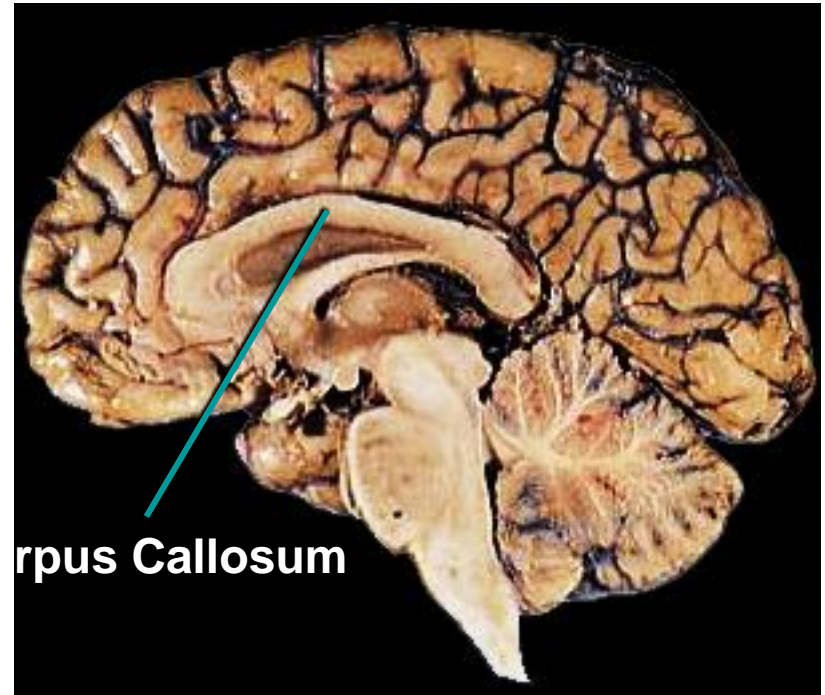






# Corpus Callosum

- Major ( but not only) pathway between sides
- Connects comparable structures on each side
- Permits data received on one side to be processed in both hemispheres
- Aids motor coordination of left and right side



# Corpus Callosum

- What happens when the corpus callosum is cut?
- Sensory inputs are still crossed (Brainstem)
- Motor outputs are still crossed (Brainstem)
- **Hemispheres can't exchange data**



# Joe - Split Brain Patient

SCIENTIFIC  
AMERICAN  

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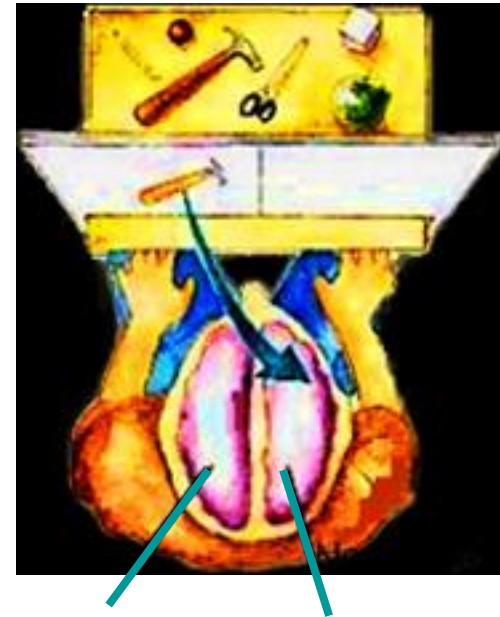
FRONTIERS

Introductory Psychology  
Video Collection

## Severed Corpus Callosum

# The 'Split Brain' studies

- Surgery for epilepsy  
: cut the corpus callosum
- Roger Sperry,  
1960's
- Special apparatus
  - picture input to just one side of brain
  - screen blocks objects on table from view



# Gazzaniga and split brain research



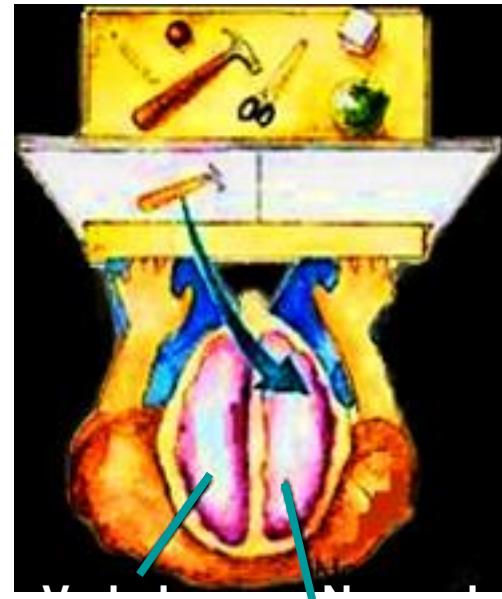
“Look at the dot.”

16. A picture of a dog is briefly flashed in the right visual field and a picture of a cat is briefly flashed in the left visual field of a split-brain patient. This individual will be able to use his \_\_\_\_\_ hand to indicate he saw a \_\_\_\_\_.

- a. right; cat
- b. left; dog
- c. left; cat
- d. right or left; dog
- e. right or left; cat

# The 'Split Brain' studies

- z **Picture to right brain**
  - y **can't name the object**
  - y **left hand can identify by touch**
- **Picture to left brain**
  - can name the object
  - left hand cannot identify by touch



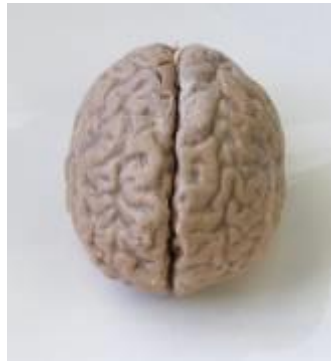
# Back to your attempt to draw 2 objects at once.....

- Why was it difficult for you to draw two objects simultaneously?
- Include the corpus callosum in your answer
- Why is it easier for a split brain patient to draw two objects simultaneously?
- Include corpus callosum in your answer

# Hemispheric Specialization

## Left Side

- Deals with inputs one at a time
- Processes information in a linear and sequential manner
- Deals with time
- Responsible for verbal expression and language
- Responsible for invariable and arithmetic operations
- Specializes in recognizing words and numbers
- Does logical and analytical thinking
- The seat of reason
- Crucial side for wordsmiths and engineers



## Right Side

- Integrates many inputs at once
- Processes information more diffusely and simultaneously
- Deals with space
- Responsible for gestures, facial movements, and body language
- Responsible for relational and mathematical operations
- Specializes in recognizing places, faces, objects, and music
- Does intuitive and holistic thinking
- The seat of passion and dreams
- Crucial side for artists, craftsman, and musicians

A picture of a cat is briefly flashed in the right visual field and a picture of a mouse is briefly flashed in the left visual field of a splitbrain patient. The individual will be able to use her:

- A. Left hand to indicate she saw a cat.
- B. left hand to indicate she saw a mouse.
- C. right hand to indicate she saw a mouse.
- D. Left or right hand to indicate she saw a cat.
- E. Left or right hand to indicate she saw a mouse.



