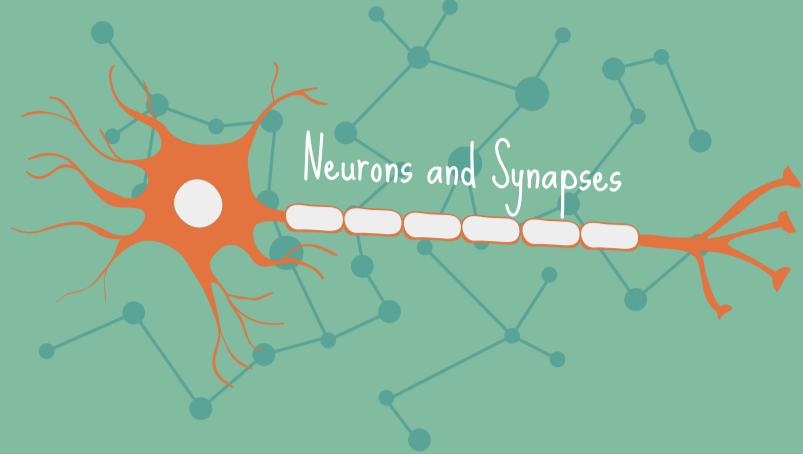


# HOW THE BRAIN LEARNS

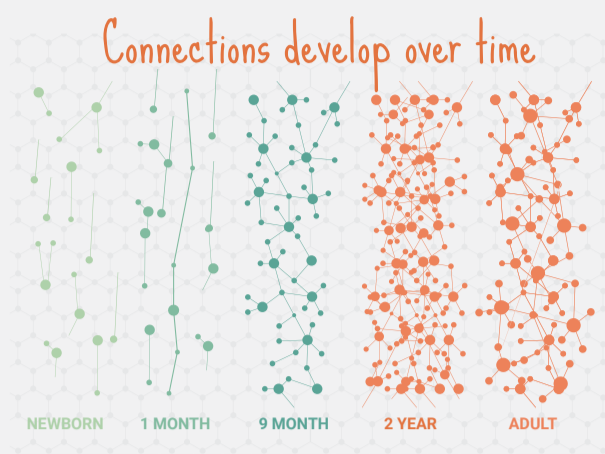


## BRAIN CELLS CONNECT

The brain is made of brain cells called neurons that create connections called synapses.

## LEARNING BY EXPERIENCE

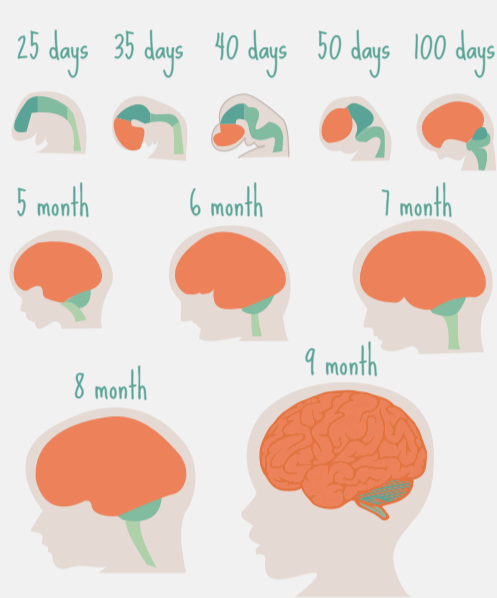
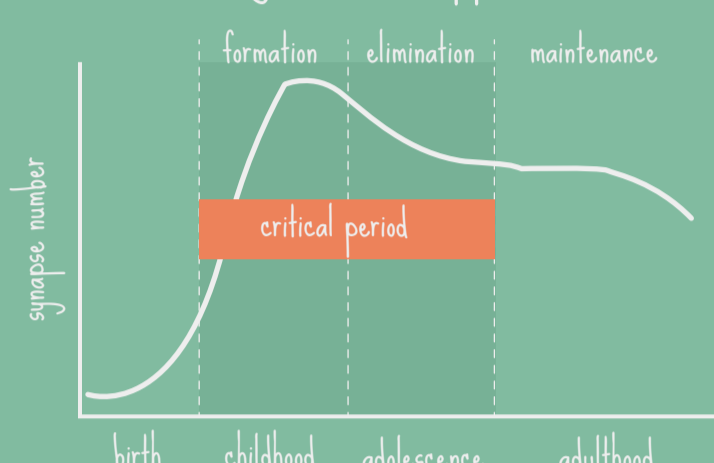
- Every new experience create new connections in the brain.
- Repeated experiences strengthen the connections.
- Unused connections disappear if not used (forgetting).



## CRITICAL PERIOD

The formation of new neurons and synapses is fastest at birth then slow down over time, that is why babies and toddlers can learn so fast compared to adults.

Connections grow and disappear over time

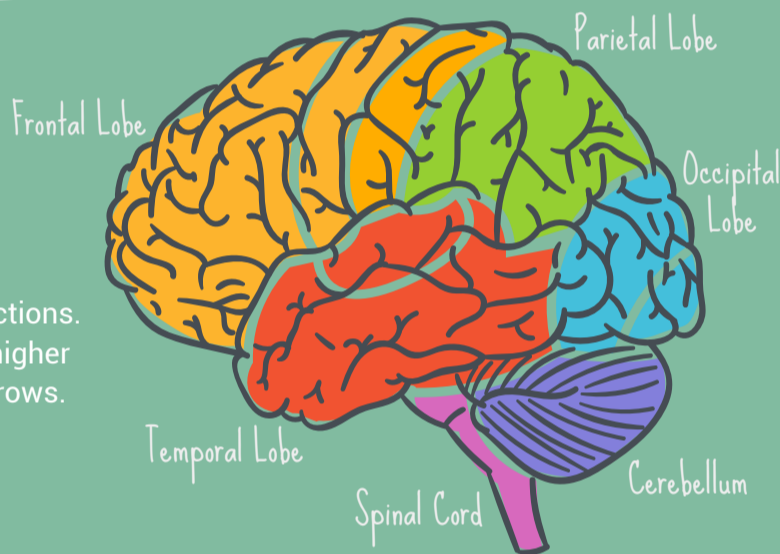


## FAST GROWTH

- At birth the brain has already grown to 25% of adult size.
- At age 3 the brain has reached 80% of its adult size.

## BRAIN FUNCTIONS

- Different areas of the brain handle different functions.
- Brain areas for basic functions exist at birth – higher brain functions become possible as the brain grows.



### Frontal Lobe

- Abstract thinking
- Problem solving
- Reasoning
- Executive functioning
- Organizing
- Motor function
- Regulates emotions
- Expressive language
- Organizes thoughts on paper
- Remembers facts from teacher
- Starts and completes tasks
- Tells stories

### Temporal Lobe

- Speech
- Auditory processing
- Hearing
- Behavior
- Emotions
- Short-term memory
- Long-term memory
- Processes what the teacher teaches
- Fear
- Fight or flight
- Retains facts

### Parietal Lobe

- Sensory Information
- Taste
- Touch
- Smell
- Temperature

### Occipital Lobe

- Visual system
- Visual Information
- Processes words on a page
- Knows shapes and sizes
- Recognizes letters
- Knows left from right

### Cerebellum

- Balance
- Coordination
- Attention
- Rhythm
- Proprioception
- Vestibular
- Kick a ball
- Throw a ball
- Jump on one foot
- Ride a bike

## OPTIMAL CONDITIONS FOR LEARNING

The best time to learn is during the period when the necessary brain cells are created in the relevant area of the brain and they are hungry to be programmed with new connections.

### optimal times to learn



## Brain Facts

- Each neuron connects with, on average, 40,000 synapses.
- All brain cells are not alike. There are as many as 10,000 specific types of neurons in the brain.
- Only 5 minutes without oxygen can cause brain damage.
- No one knows for sure, but the latest estimate is that our brains contain roughly 86 billion brain cells.