

THE TEEN BRAIN: A WORK IN PROGRESS

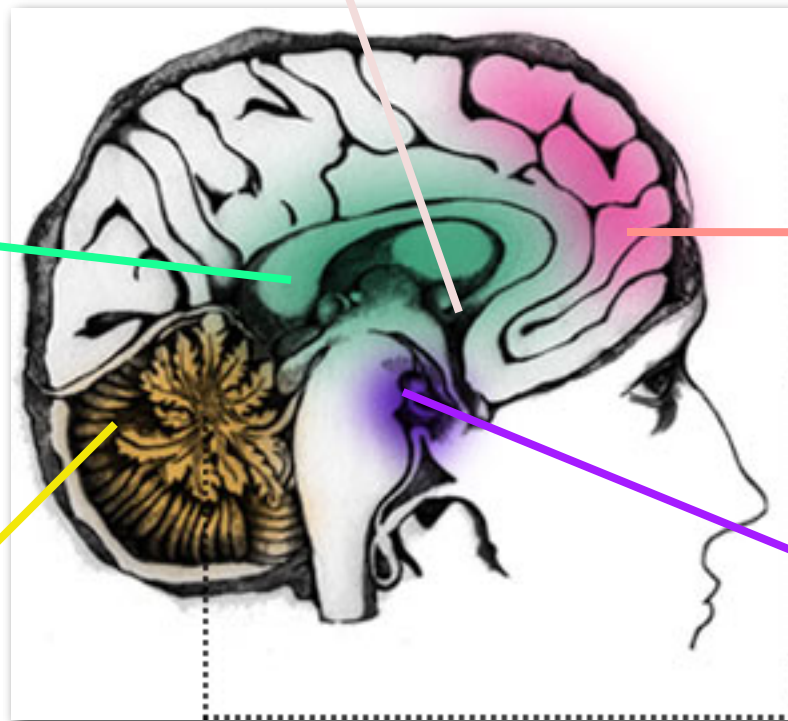
Nucleus accumbens *

Corpus
Callosum *

Cerebellum *

Frontal
lobes *

Amygdala *



***** AREAS UNDERGOING UPGRADE

PERFORMANCE EDGE TIP



**STAY ENERGIZED:
GET HYDRATED!**

PERFORMANCE EDGE TIP



**ENRICH YOUR BRAIN
THROUGH LEARNING!**

PERFORMANCE EDGE TIP



**BE SMART:
EXERCISE YOUR BRAIN!**

PERFORMANCE EDGE TIP



**EAT FRESH, HEALTHY FOOD
(STAY AWAY FROM JUNK FOOD)**

PERFORMANCE EDGE TIP



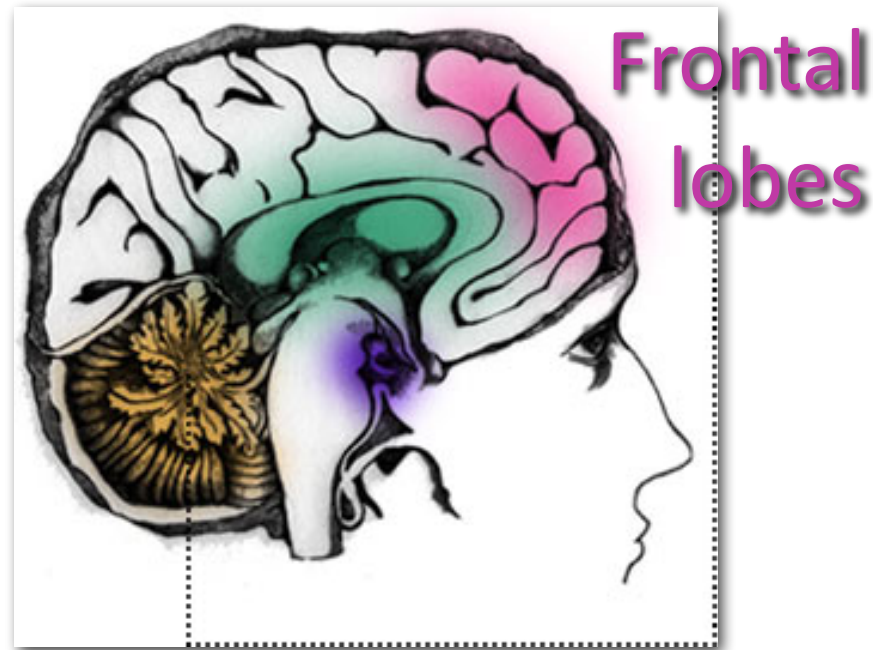
**SUCCESS IN *EVERYTHING* =
PRACTICE, PRACTICE, PRACTICE!**

PERFORMANCE EDGE TIP



**MUSIC, THE ARTS, SPORTS:
GO FOR IT!**

PERFORMANCE EDGE TIP



**THE FRONTAL LOBES:
YOUR TICKET TO SUCCESS!**

PERFORMANCE EDGE TIP



BE SMART: DON'T START!

PERFORMANCE EDGE TIP



GET THE DOWNTIME ADVANTAGE!

PERFORMANCE EDGE TIP



STRESS:

IT'S *HOW* YOU THINK ABOUT IT

PERFORMANCE EDGE TIP



**MINDFULNESS PRACTICE:
FOR BRAIN, MIND, BODY, SPIRIT**

PERFORMANCE EDGE TIP



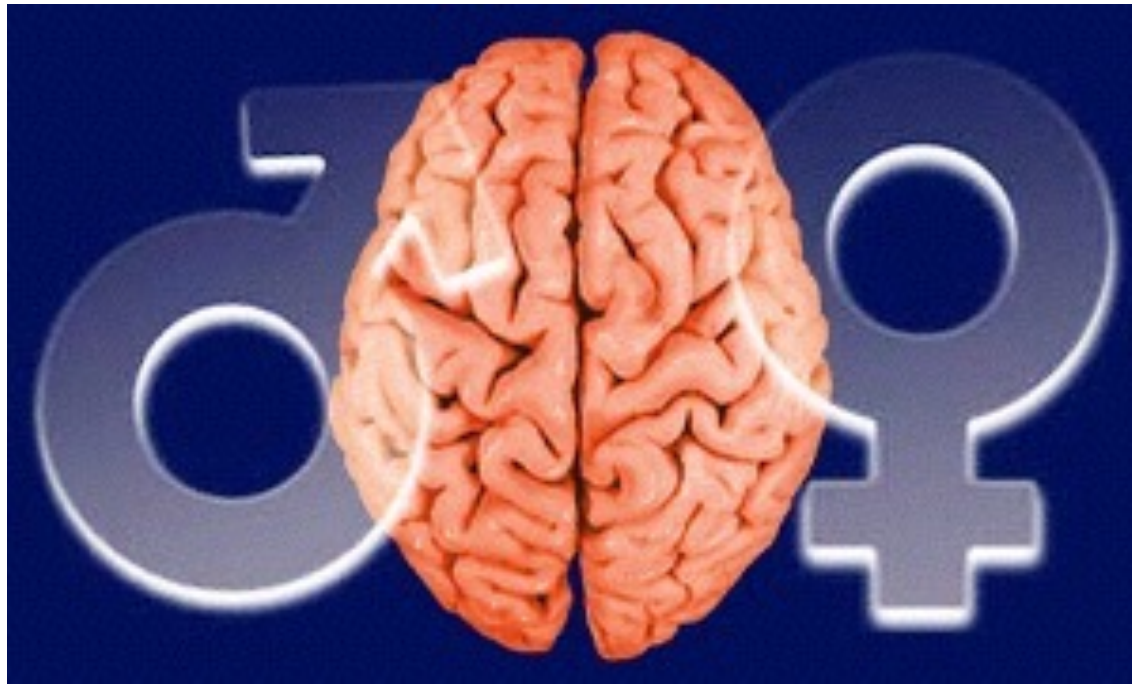
**BALANCE THE MIND:
BUT FIRST, LEARN WHAT IT IS!**

PERFORMANCE EDGE TIP



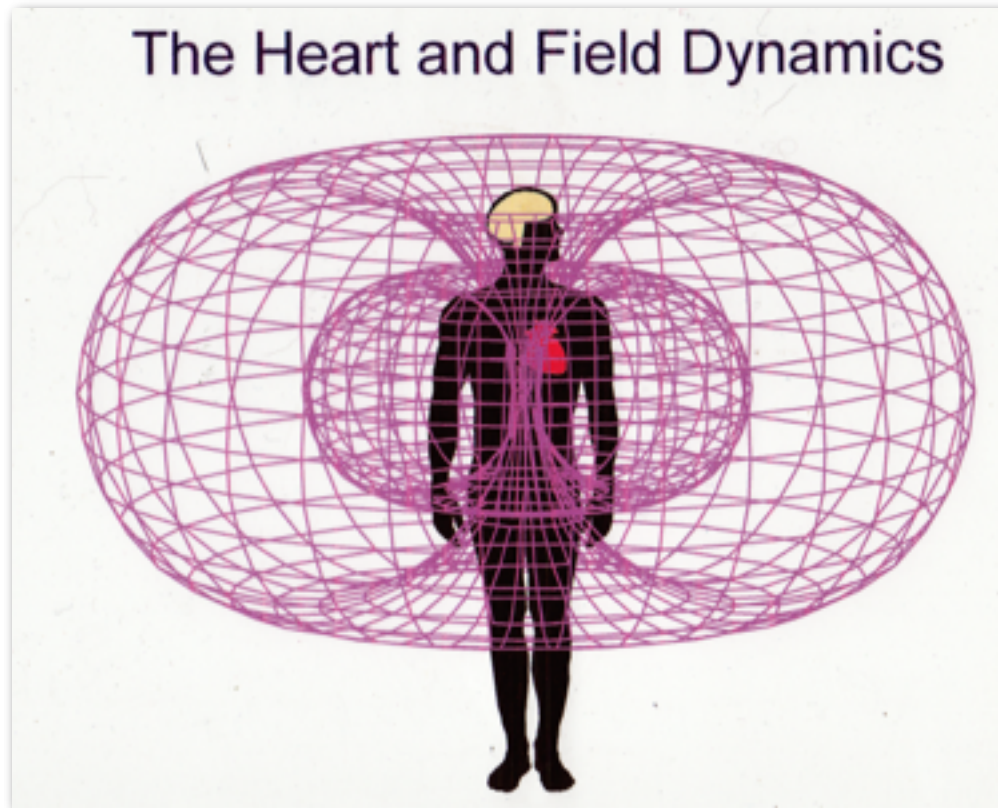
SLEEP:
DON'T LEAVE HOME WITHOUT IT!

PERFORMANCE EDGE TIP



**MALE - FEMALE BRAINS:
WHAT'S THE SCOOP?**

PERFORMANCE EDGE TIP



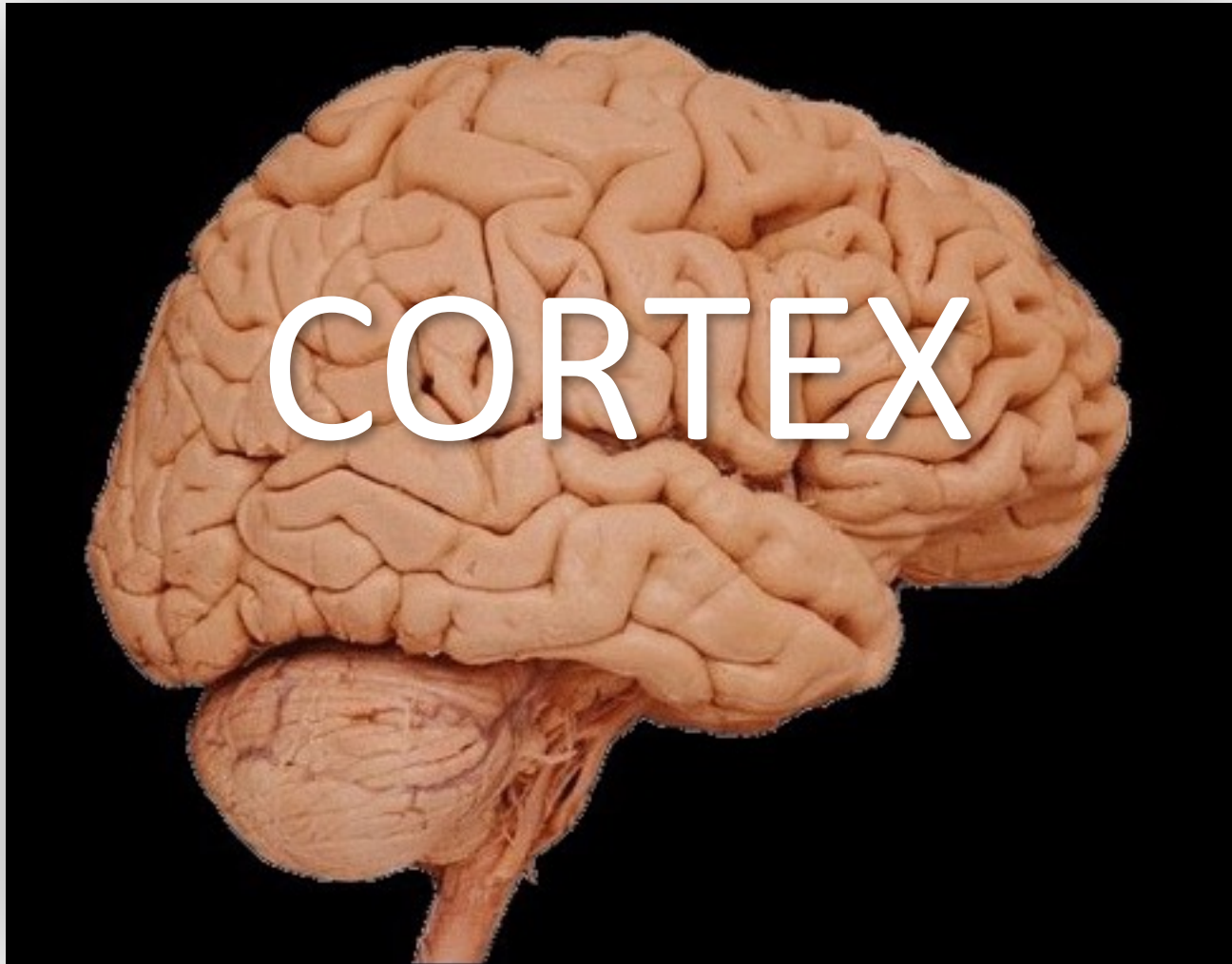
HEART-SMART:
A GREAT WAY TO LEARN, LIVE AND LOVE

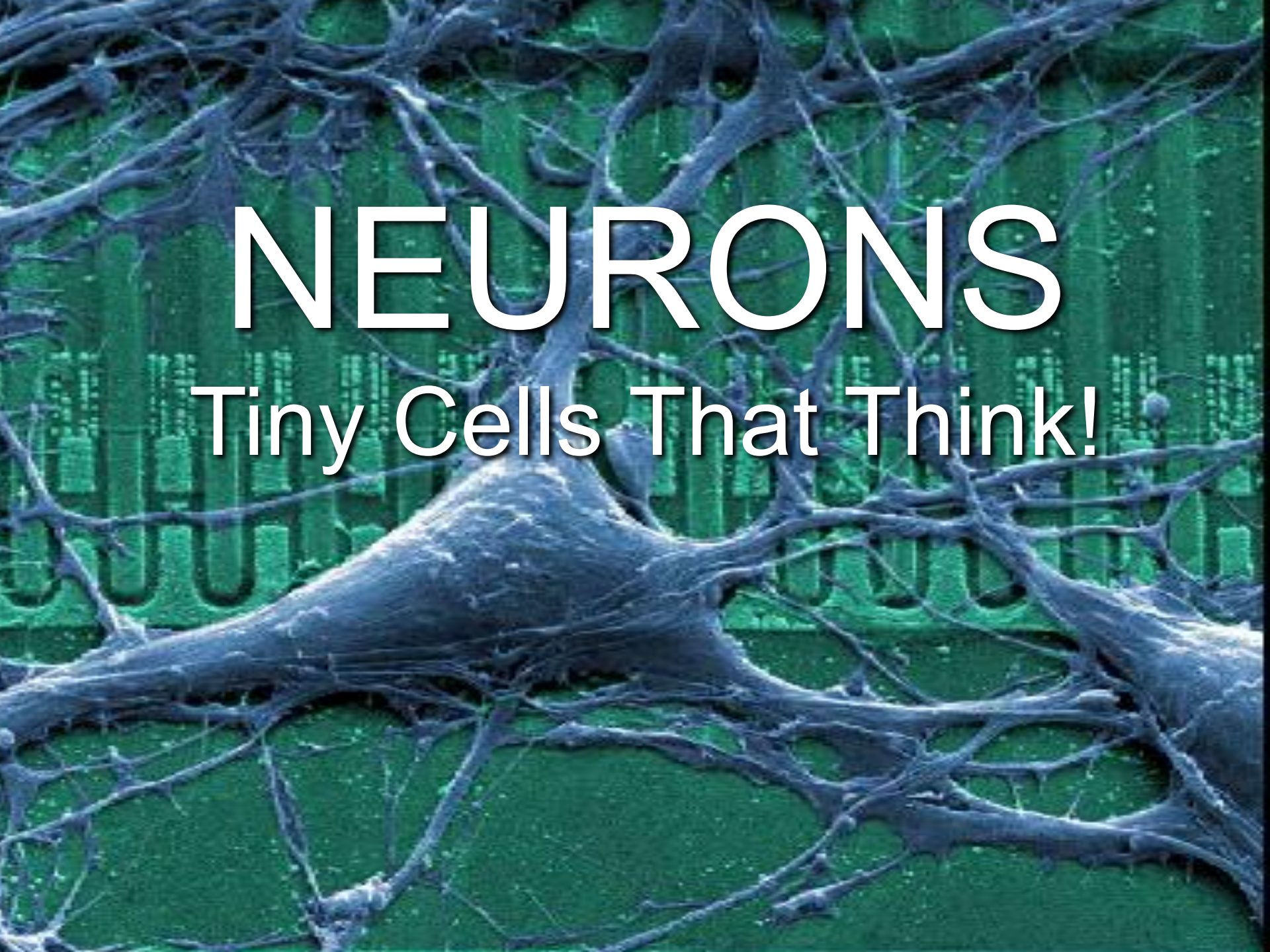
Frontal Lobes of the Brain

- Envision the future
- Dream big dreams
- Set goals
- Carry out plans
- Detect problems
- Solve problems
- Manage emotions
- Control impulses
- Consider consequences



HUMAN BRAIN

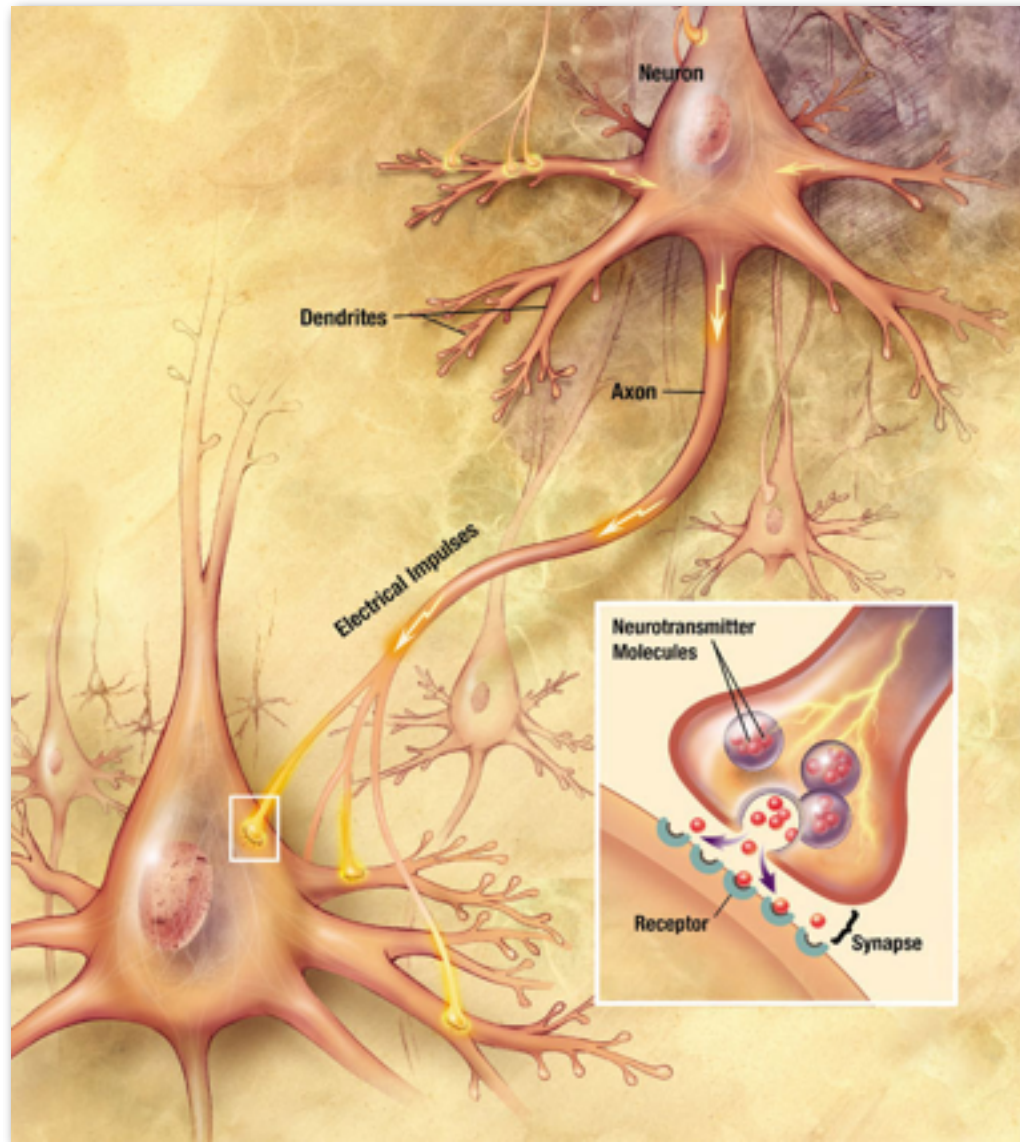


A microscopic image of neurons, showing a central cell body (soma) with numerous branching processes (dendrites and axons) extending outwards. The image is stained, giving it a reddish-pink hue. The text "NEURONS" and "Tiny Cells That Think!" is overlaid on the image.

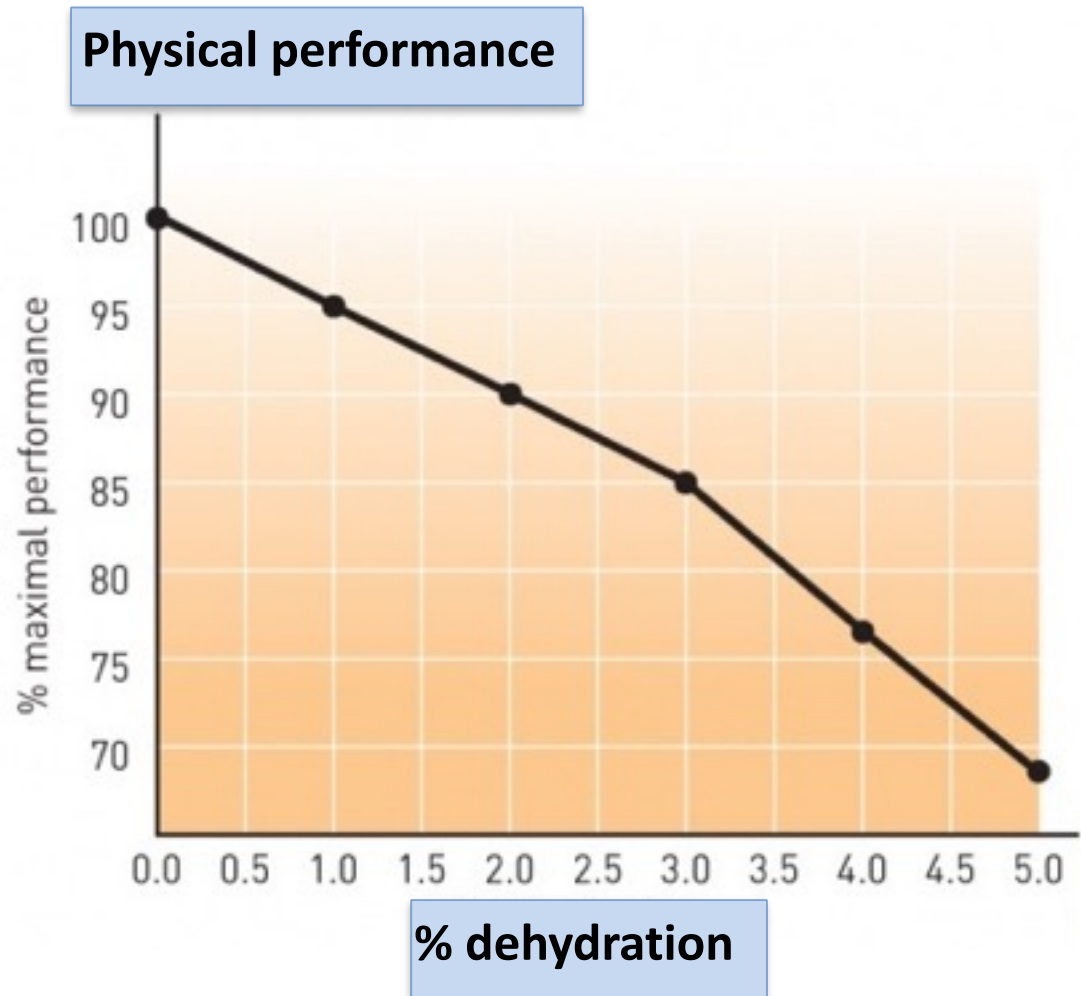
NEURONS

Tiny Cells That Think!

Powered By Electricity!



Benefits of Hydration



How Much Water Per Day?

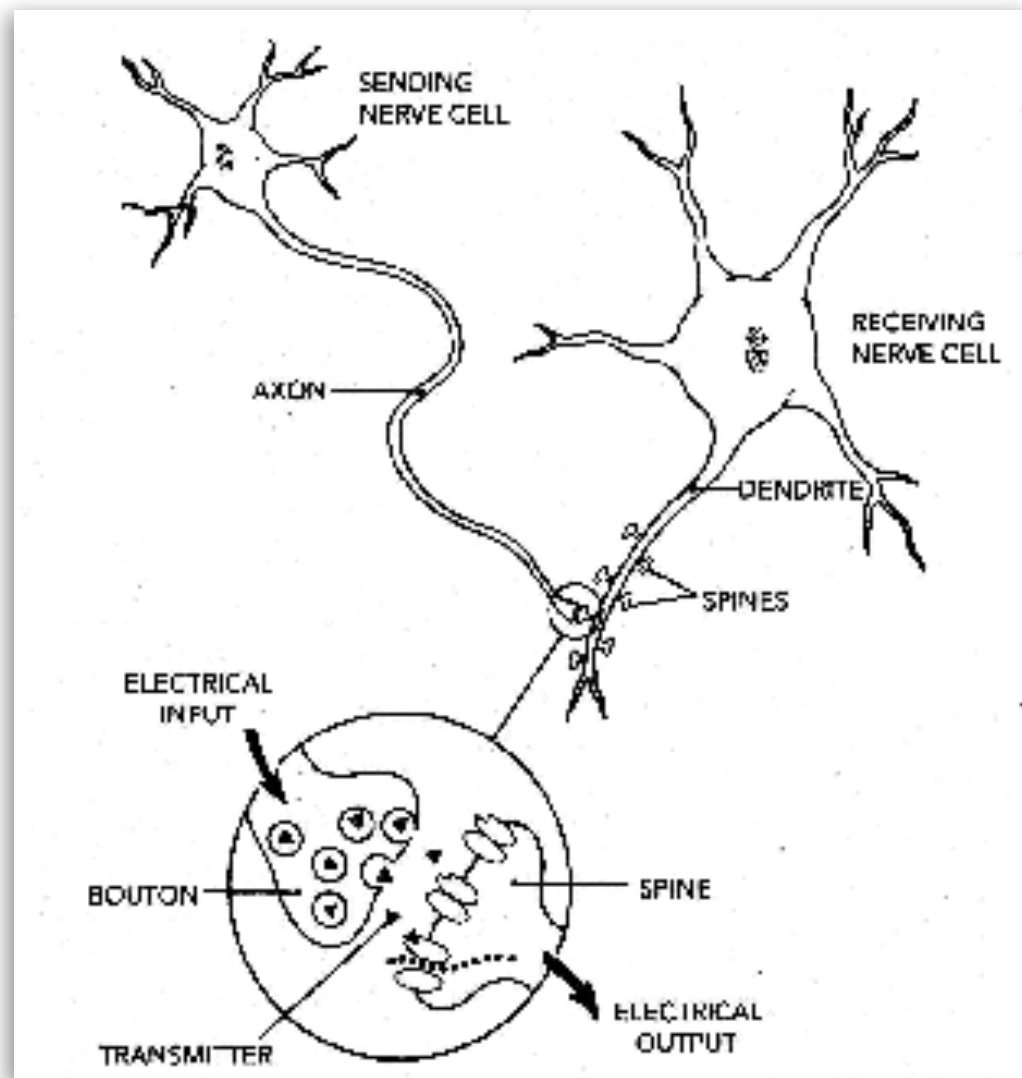
25 pounds/10 kilograms =
8 fl. oz. of water

OR

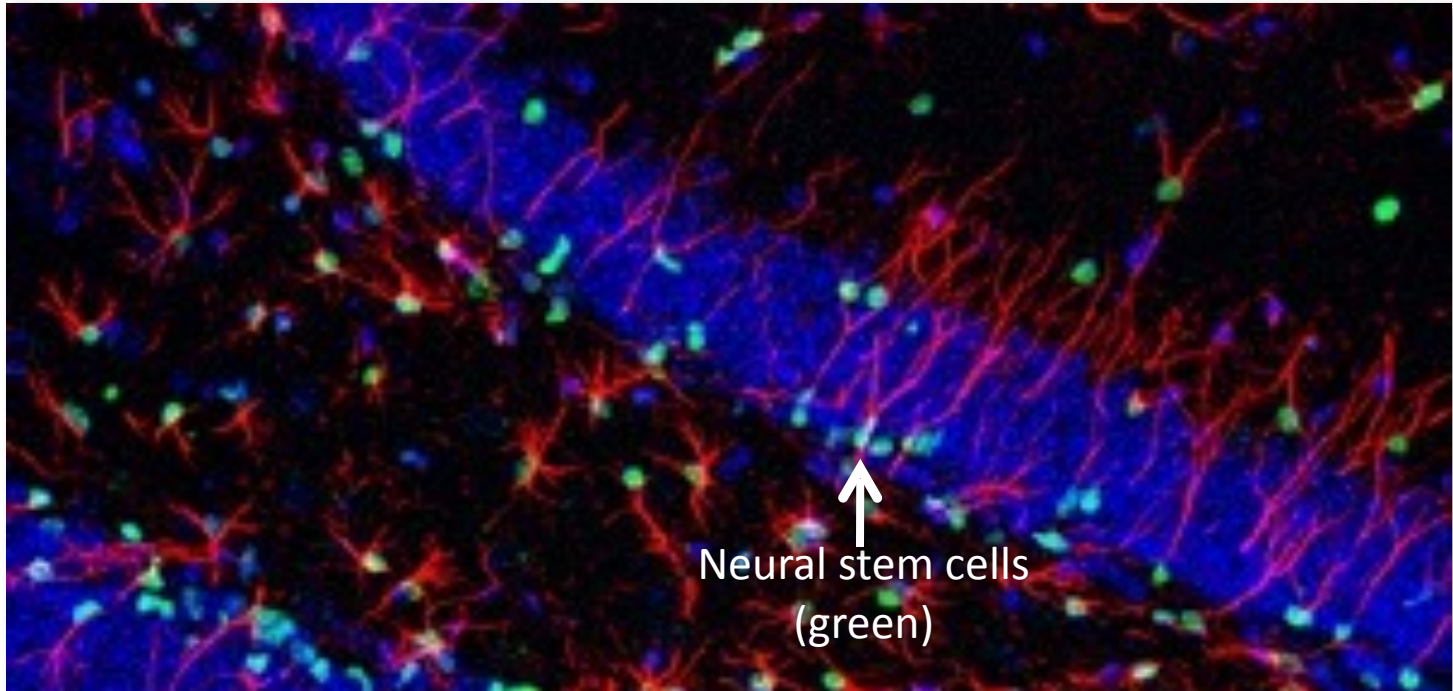
.25 liter



Neuron



The brain produces new neurons daily!

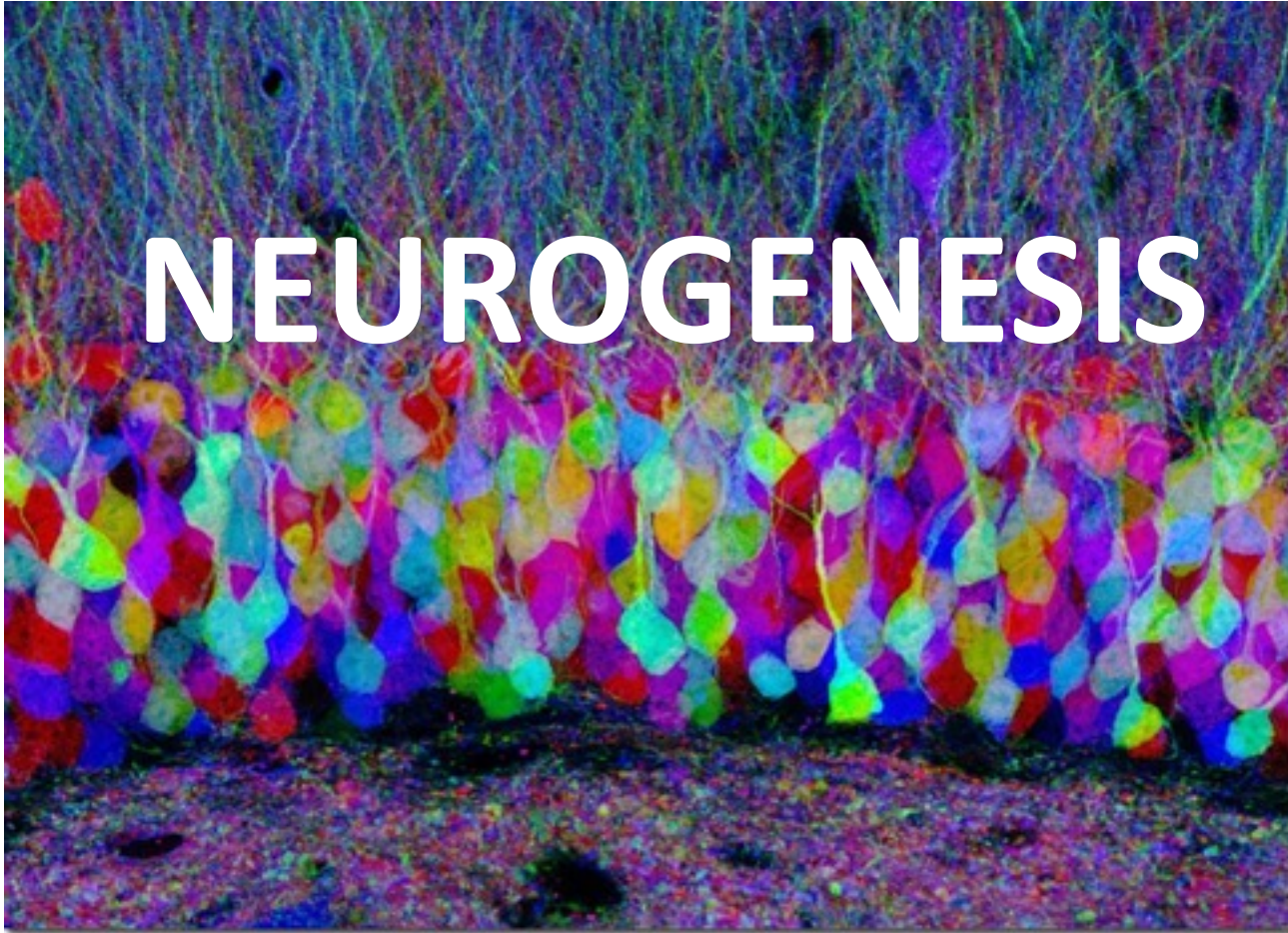


Fred H. Gage, Ph.D.

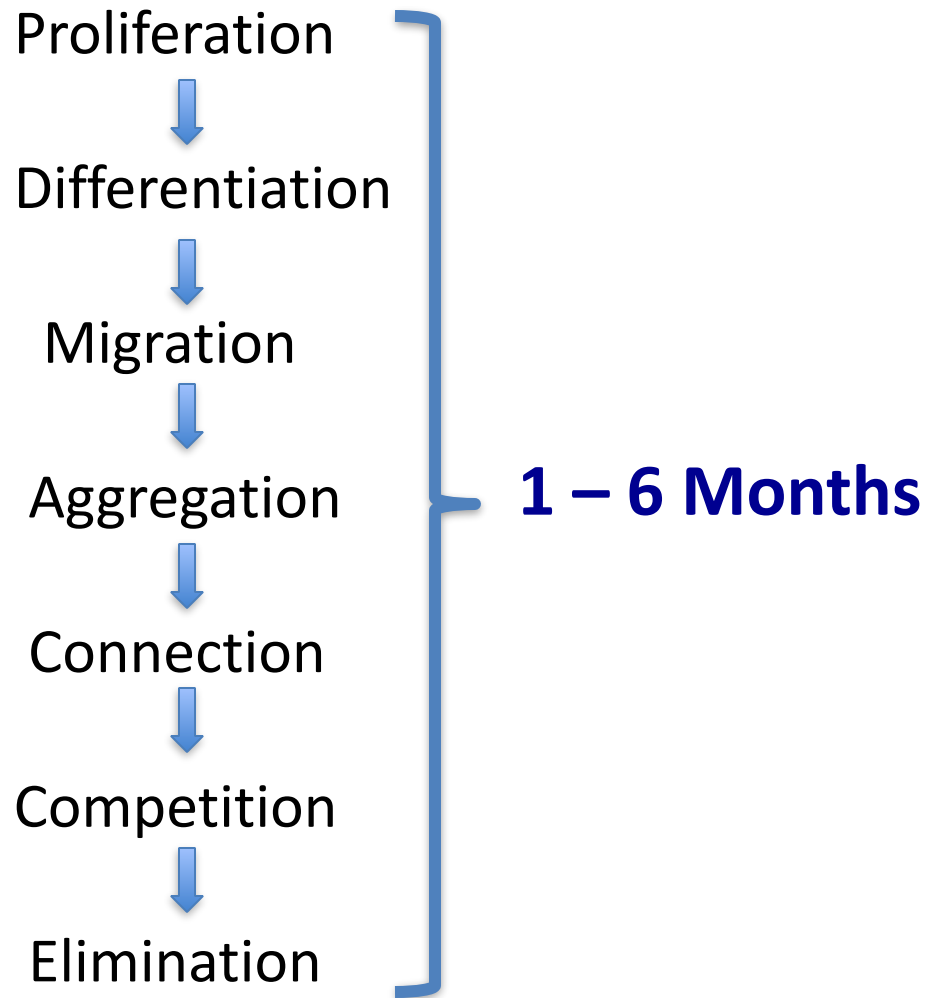
“Work-life balance: Brain stem cells need their rest, too.” Salk Institute for Biological Studies,

Online: http://salk.edu/news/pressrelease_details.php?press_id=428

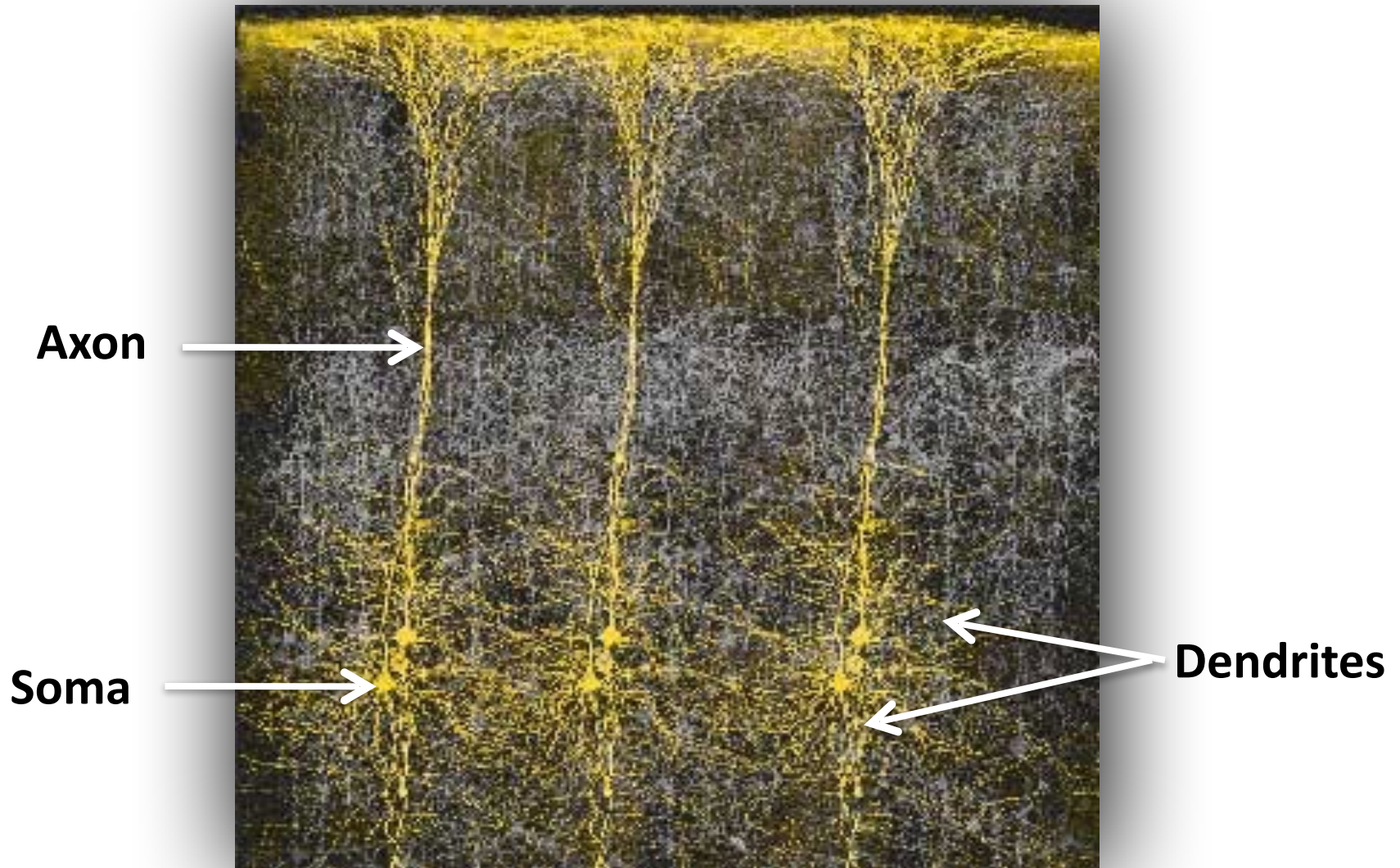
The brain produces new neurons daily!



Stages of Neural Organization

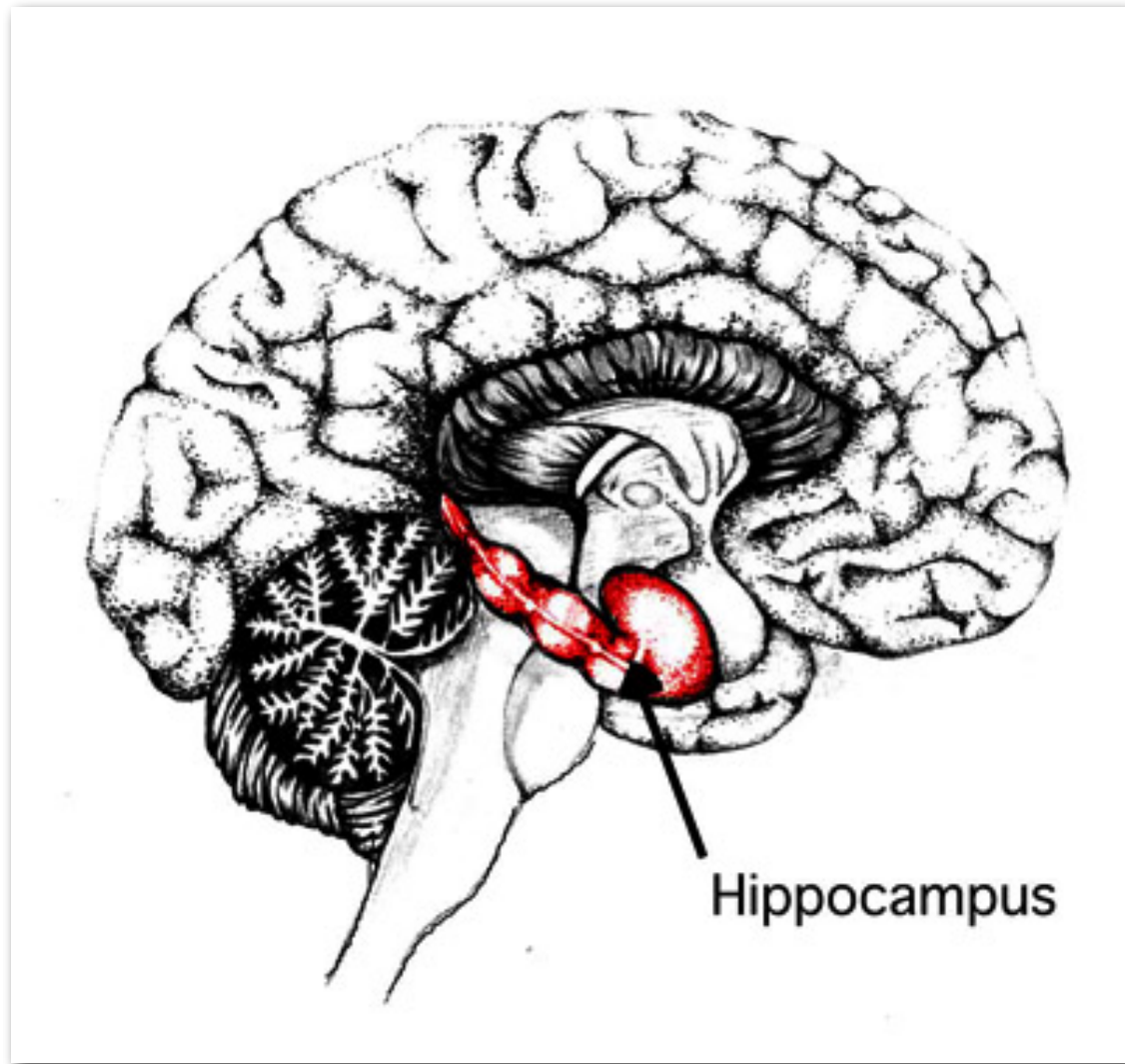


We get new neurons every day!



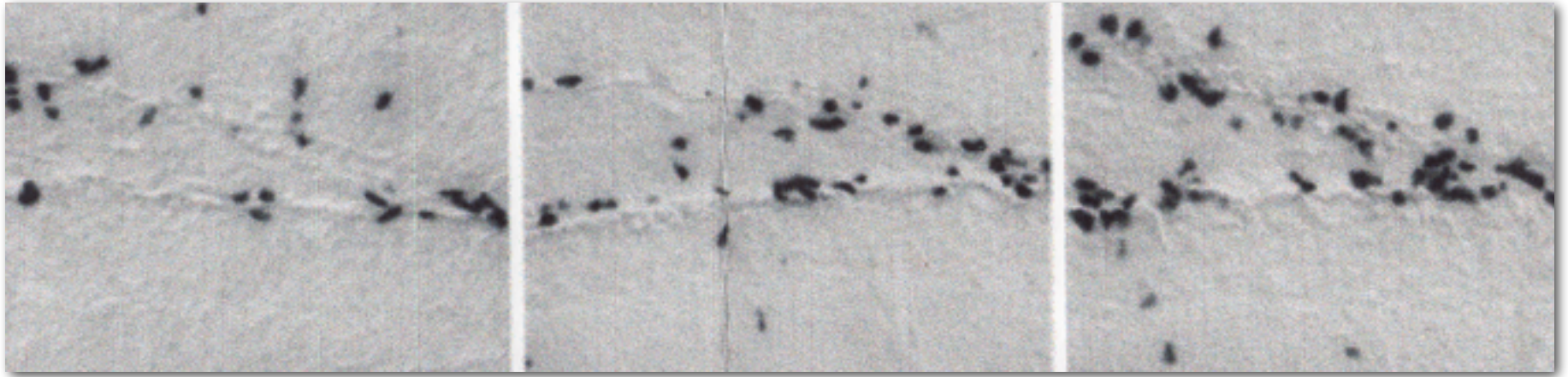
Brown, J. Cooper-Kuhn, C. Kempermann, G, Van Praag, H. Winkler, J, Gage, F. & Kuhn, H.
"Enriched environment and physical activity stimulate hippocampal but not olfactory bulb
neurogenesis. *European J. of Neuroscience*, 17 (10), 2042-2046.

HIPPOCAMPUS



Processes, labels and stores information as memories

Neurogenesis



STANDARD

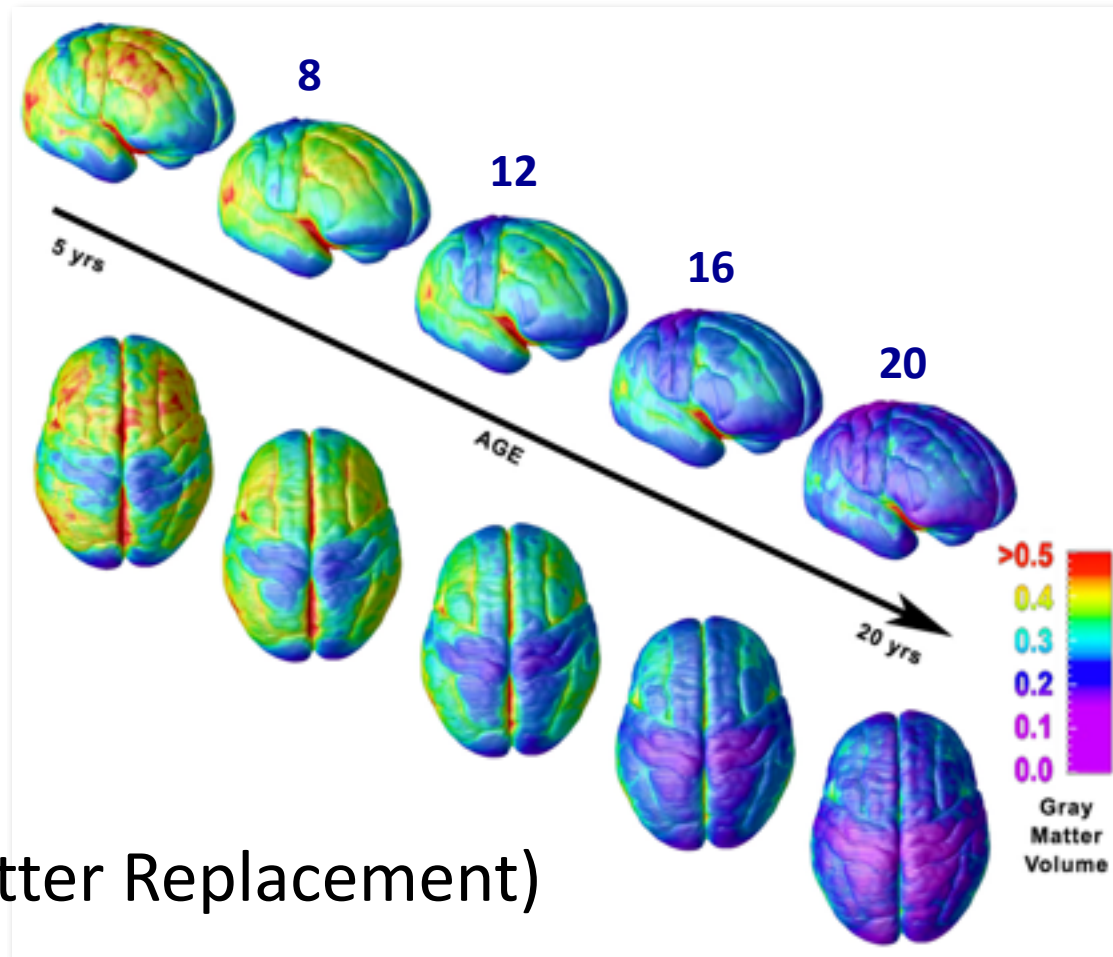
ENRICHED

EXERCISE

COMPARATIVE LEARNING ENVIRONMENTS

Brown, J., Cooper-Kuhn, C. Kempermann, G, Van Praag, H. Winkler, J, Gage, F. & Kuhn, H.
“Enriched environment and physical activity stimulate hippocampal but not olfactory bulb
neurogenesis. *European J. of Neuroscience*, 17 (10), 2042-2046.

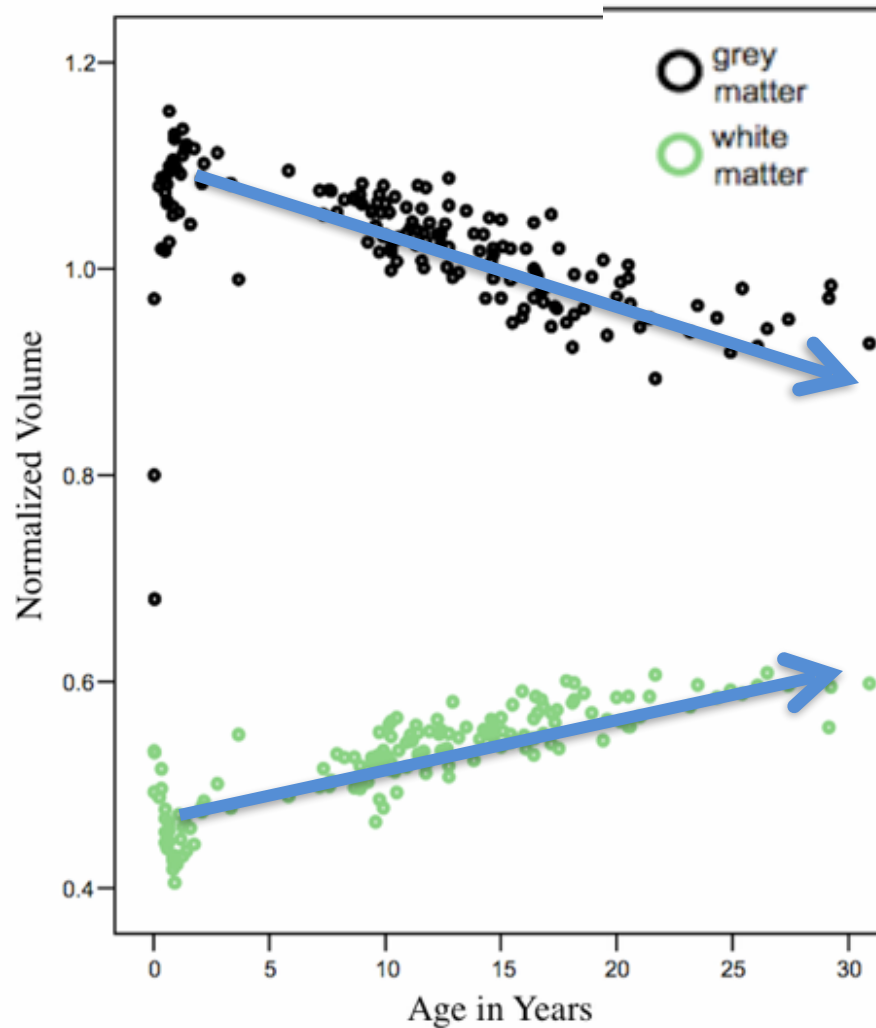
Gray Matter: Peak and Decline



(White Matter Replacement)

Giedd, J. N., et al,
“Brain development during childhood and adolescence: a longitudinal MRI study.”
Nature Neuroscience, 2, 1999, pp. 861-863

GRAY and WHITE MATTER

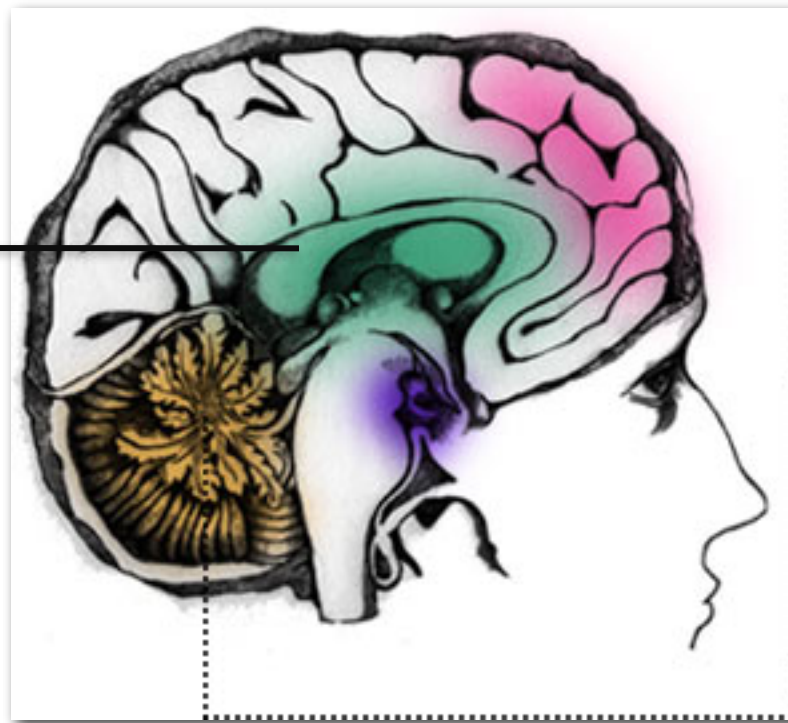


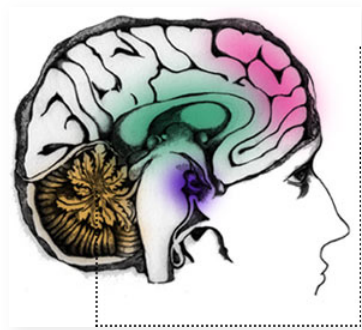
GRAY MATTER

WHITE MATTER

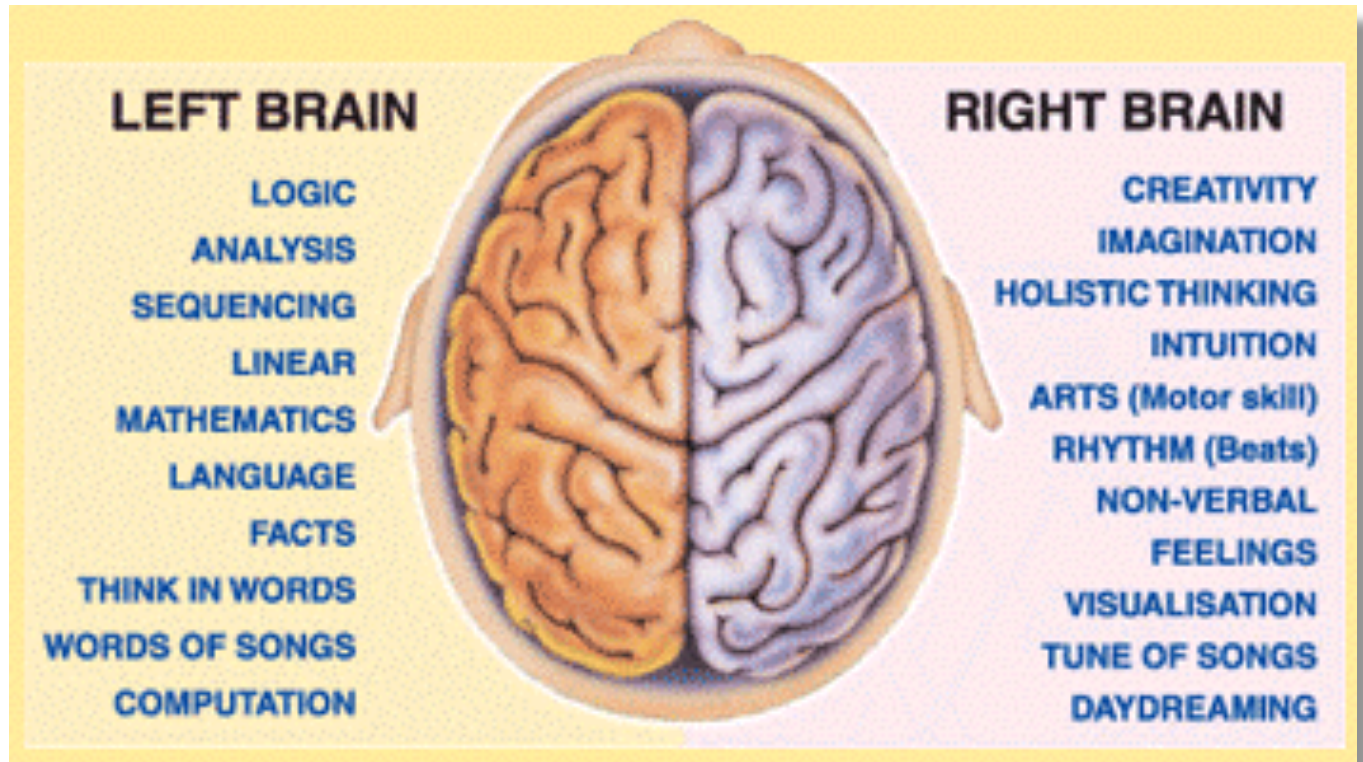
THE AMAZING TEEN BRAIN: A WORK IN PROGRESS

Corpus
Callosum



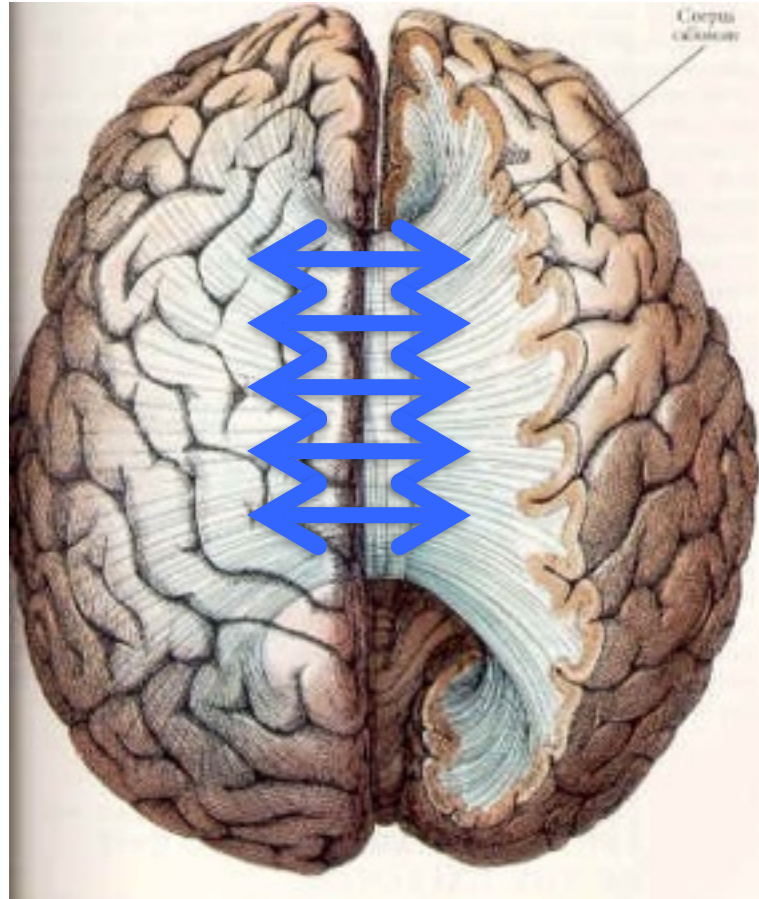


Corpus Callosum



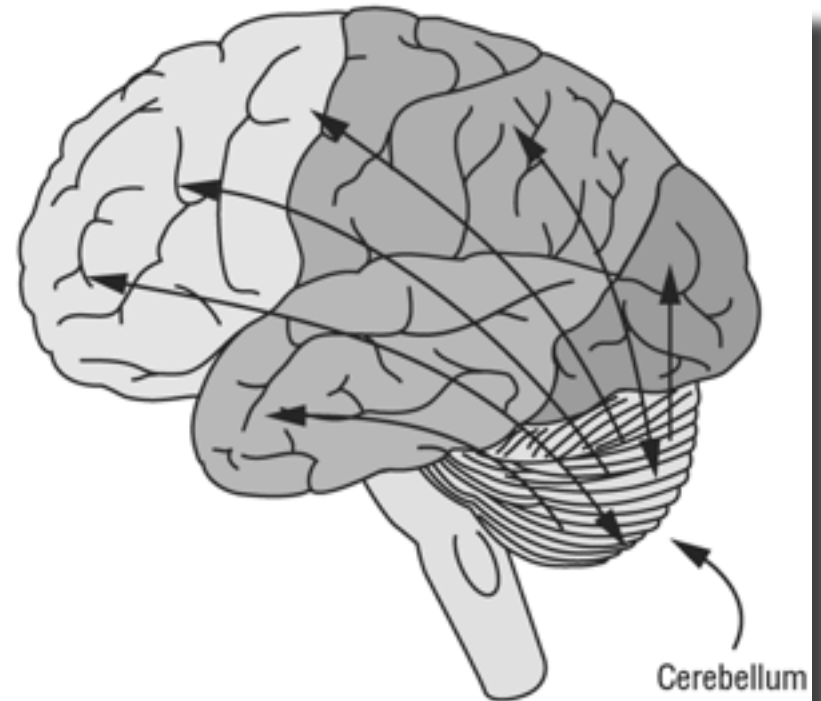
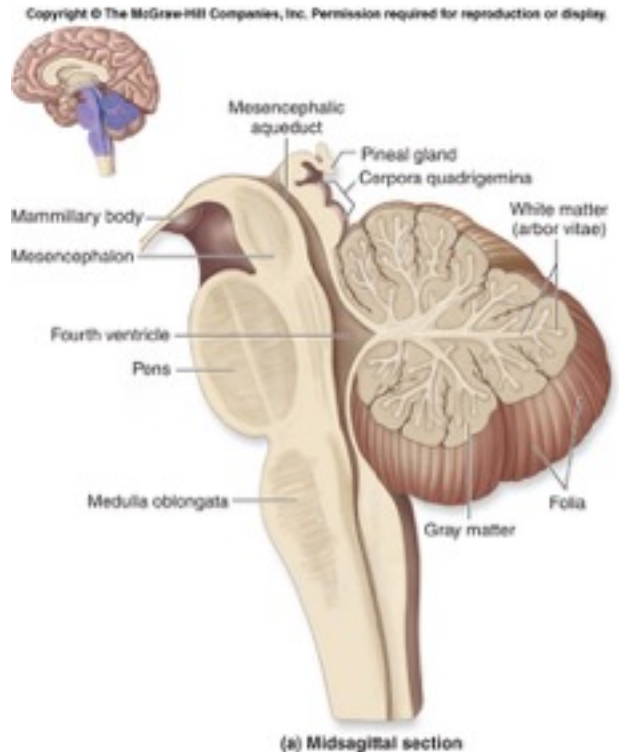


Corpus Callosum



Controls Problem Solving and Creativity

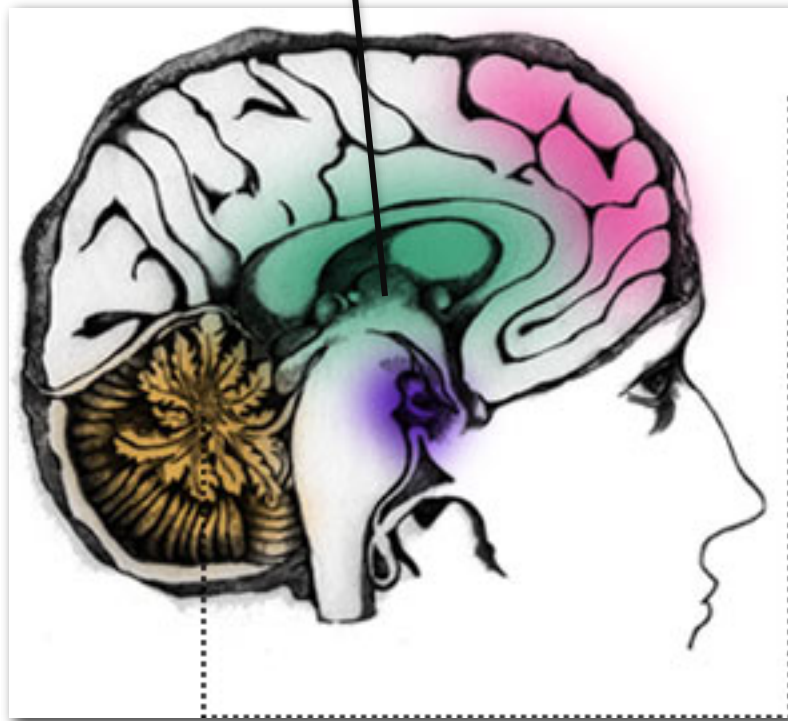
Cerebellum



Controls Balance and Coordination
Activates the Frontal Lobes

THE AMAZING TEEN BRAIN: A WORK IN PROGRESS

Nucleus accumbens *



NEUROTRANSMITTERS

Excitatory:

Nor-epinephrine

Dopamine

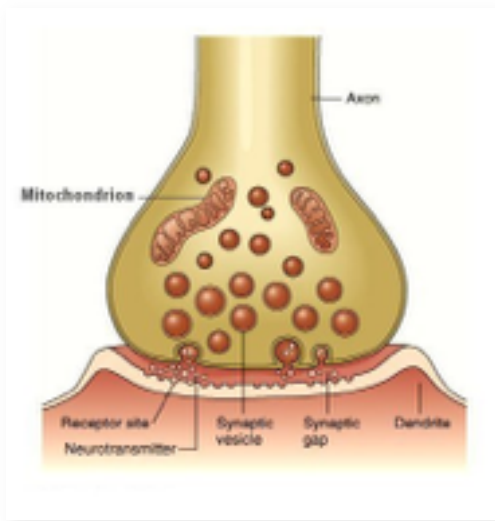
Acetylcholine

Inhibitory:

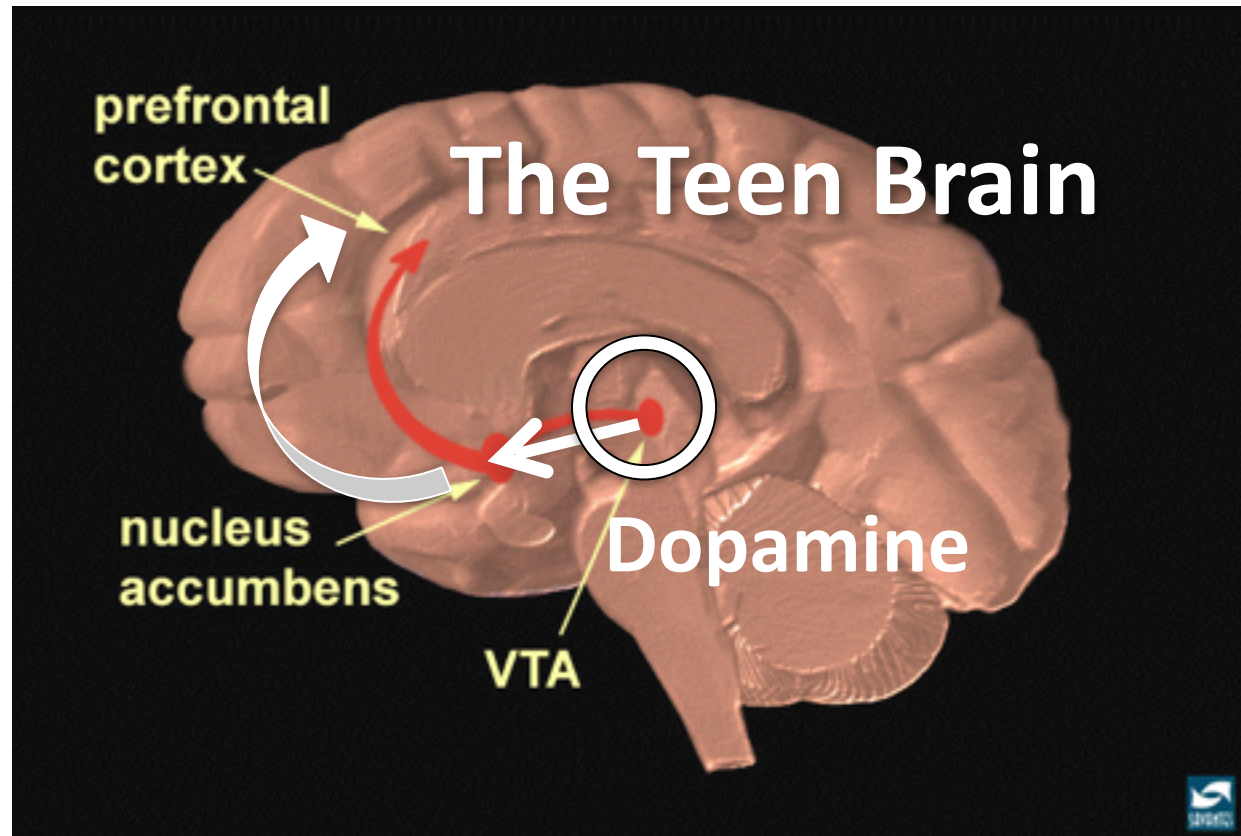
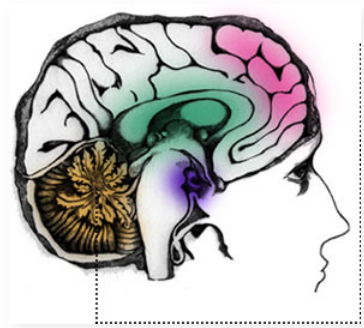
Serotonin

G.A.B.A.

Endorphin

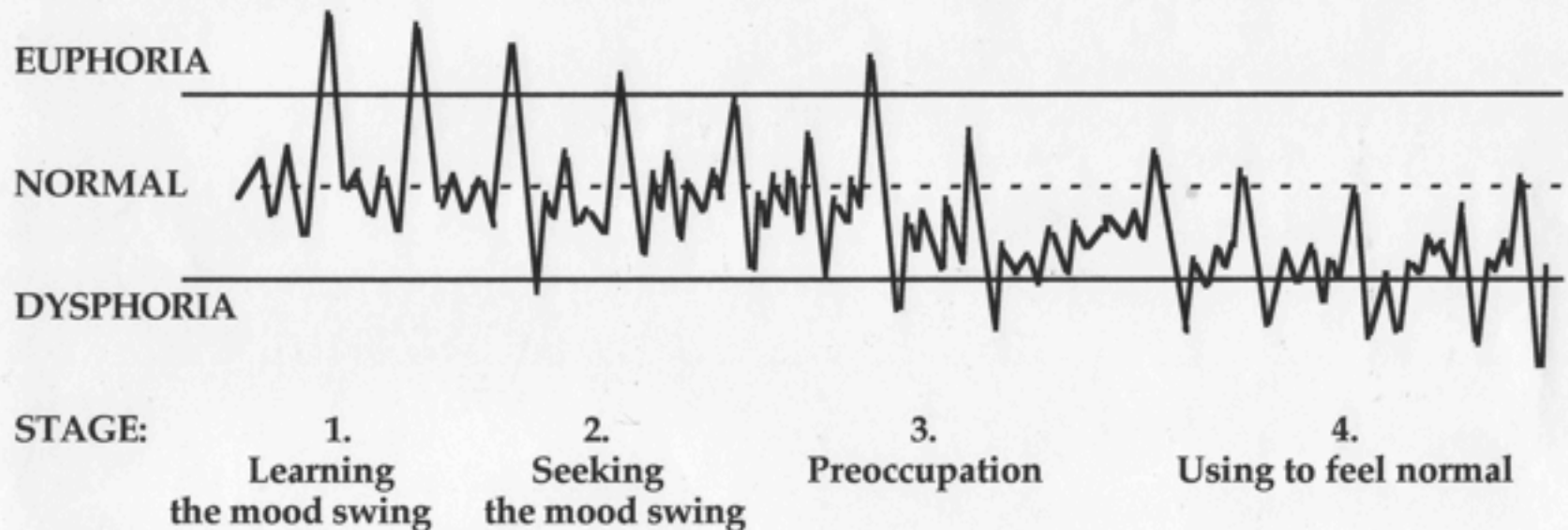


Secondary Pleasure and Reward



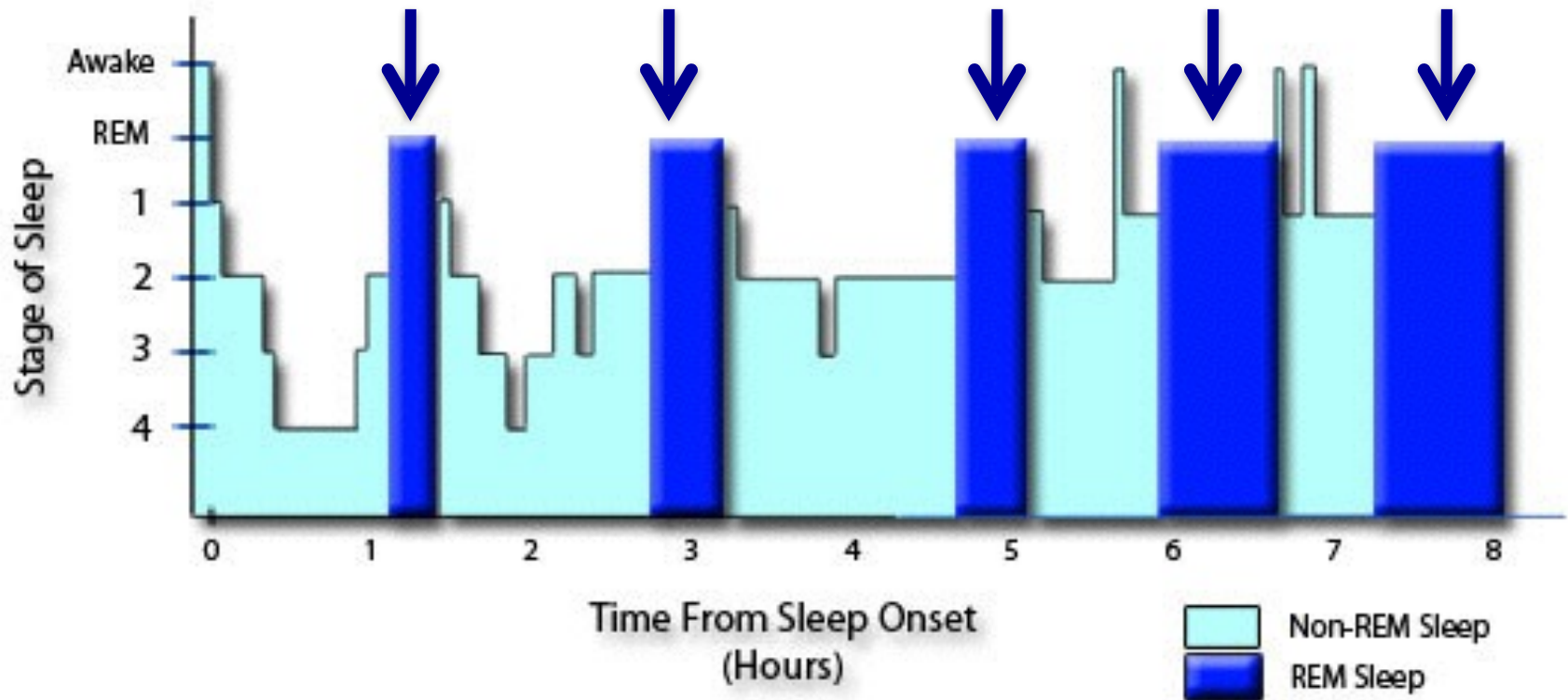
EFFECTS of ALCOHOL and OTHER DRUGS

RANGE OF EMOTIONS --DRUG INDUCED--

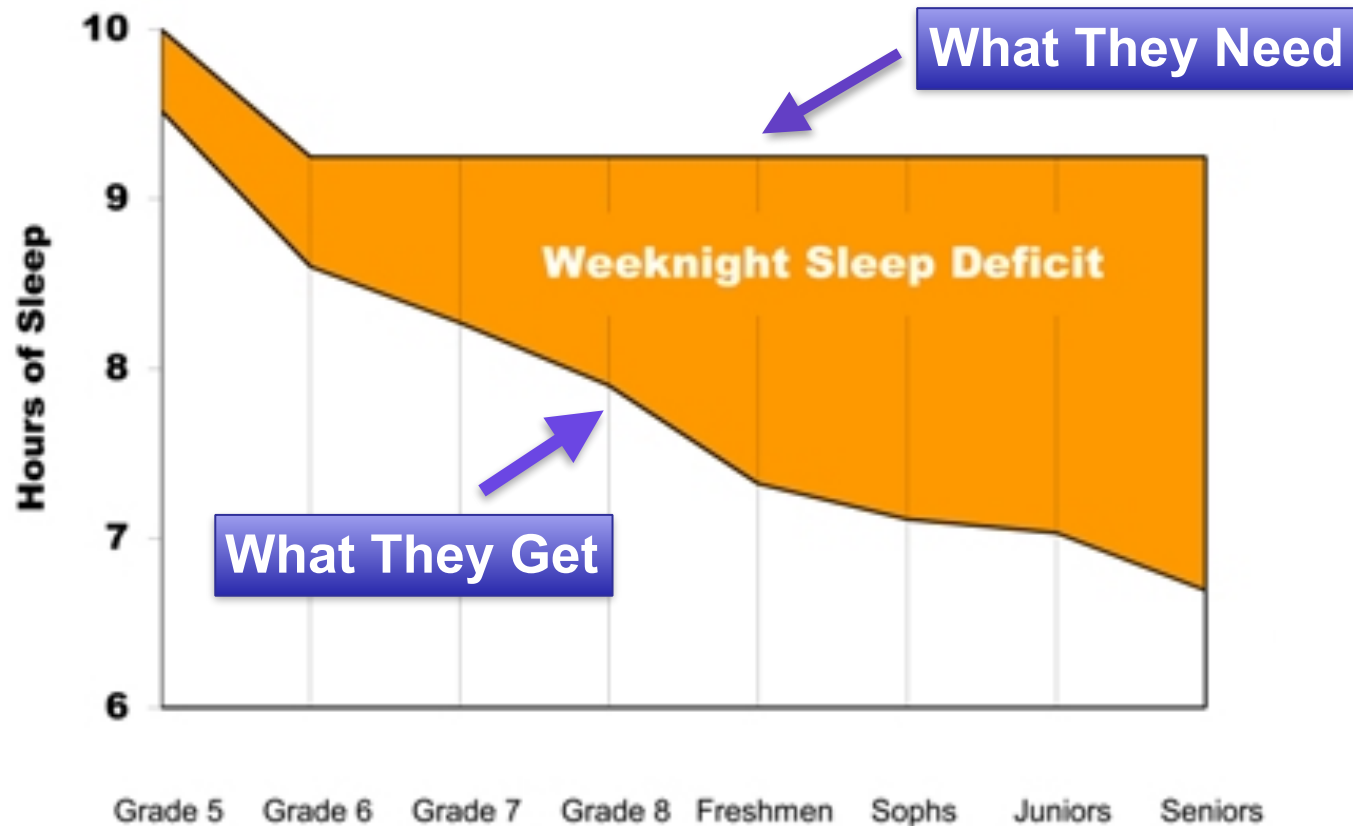


STAGES of SLEEP and LEARNING

Dream Cycles Through the Night



SLEEP REQUIREMENTS



“Poor Sleep Can Negatively Affect a Student’s Grades,” Fred Danner, Ph.D.
American Academy of Sleep Medicine, June 9, 2008

SLEEP and LEARNING

MEMORY ENCODING

‘A’ students

average 15 more minutes of sleep

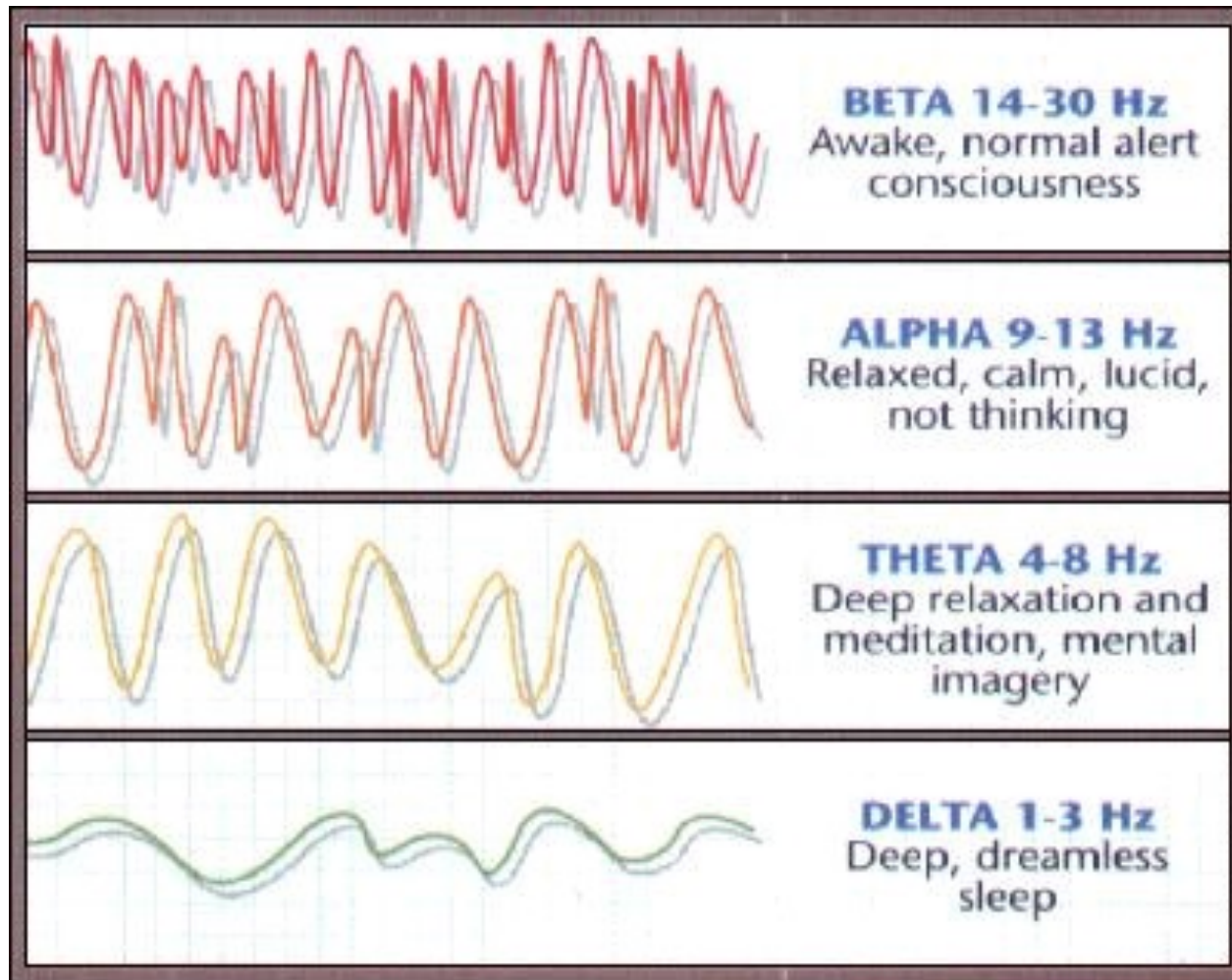
than ‘B’ students,

average 15 more minutes of sleep

than ‘C’ students

BRAIN-MIND STATES

EEG Brainwave Activity



Findings on Daydreaming

- About *one-third* of our time is spent daydreaming
- The brain activates several areas associated with *complex problem solving*
- Recent brain scans reveal that the brain may be most *actively engaged* when wandering
- **During daydreaming the brain makes new *associations and forges new neural connections***