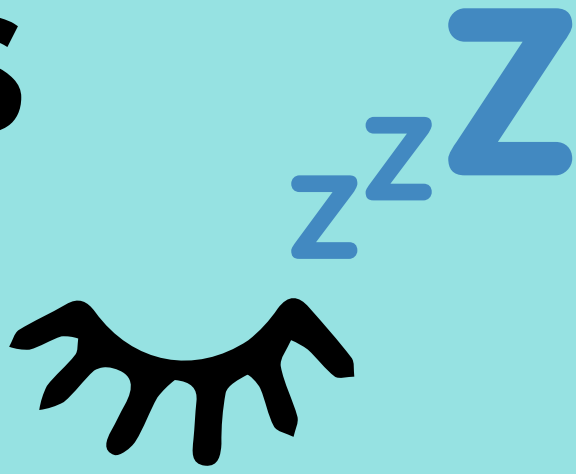
WHAT DOES OUR BRAIN DO WHEN WE SLEEP?



by the Empowerment through Science & Technology Initiative (ESTI)

Our brains **don't** shut off when we sleep.
They're just as active when we're asleep!

WHY DO WE NEED SLEEP?

A healthy amount of sleep is important for brain plasticity, which is the brain's ability to adapt to different inputs. Without a healthy amount of sleep, we won't be able to process what we've learned for the day and we'd have a difficult time remembering things for the future.

Our brains repeatedly go through 2 cycles: non-rapid-eye movement (non-REM) and rapid-eye movement sleep. With each cycle, your body spends less time in deep sleep, and more time in REM sleep. Typically, a person goes through these 2 cycles four or five times throughout the night.

1 NON-REM SLEEP

The first part of the sleep cycle is non-REM sleep, which contains four stages:

1. The first stage is between waking and falling asleep. Right now, your body is adjusting into sleep
2. The second stage is light sleeping. Your heart rate and breathing begin to regulate, and your body temperature drops
3. The third and fourth stage is deep sleeping.
4.

Previous research emphasized the importance of REM sleep for learning and memory, but new research has shown that non-REM sleep is just as important. Additionally, non-REM sleep is important for a more restful and restorative sleep.

Recent research has also shown that during non-REM sleep, our brain's cerebrospinal fluid (CSF) flushes out toxic waste from our brain. Without CSF flushing out toxic waste, there is an increase chance of developing dementia and Alzheimer's disease.

REM SLEEP 2

During REM sleep, the eyes move rapidly while the lids are closed, and brain waves are similar to when you're awake.

Your breathing rate begins to increase, and the brain sends signals to the rest of your body that leaves it temporarily paralyzed while dreaming.

YOUR BODY HAS TWO PROCESSES THAT REGULATE SLEEP

Circadian Rhythm
This is a biological clock in the brain that responds to light cues (e.g., sunlight). When it comes time to sleep, your circadian rhythm increases the production of the hormone melatonin, and, when it senses light (e.g., sunrise) it switches off production.

Sleep Drive
Like your craving for food, your body also craves sleep. Throughout the day, your body's need for sleep builds up, and, after a certain point, your body needs sleep. Unlike hunger, which you can control whether you eat or not, your body will force itself to sleep even if you're working or driving.

The Empowerment through Science & Technology Initiative (ESTI) brought to you by the Cole Neurocognition Lab at Rutgers University

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