Theories of Sleep (Mental Restoration): Another theory is that sleep allows our brain to go through a period of rest and repair. Most animals with simple brains require no sleep. Metabolic activity of the brain drops by 75% during stage 4 sleep as well.

Horne & Minard: Study done in 1985 to research our sleep behaviors following engagement in a mentally strenuous activity. For 4 nights, patients sleep behavior was recorded and on a random day patients engaged in a wide array of mentally strenuous activities. Following these activities, it was recorded that patients slept the same amount, but spent more time in stage 3 and 4.

Sleep Deprivation: Randy Gardner, a college student, stayed up for 11 straight days to see what the affects would be. It was discovered that there was no decline in performance on active or complex tasks (sports, maintaining a conversation). However, Gardner showed difficulty staying focused on mundane tasks and suffered from emotional instability and hallucinations.

Theories of Sleep (Memory and Brain Development):
Rapid Eye Movement (REM): REM sleep plays an important role in learning and brain development. It’s named after the characteristic pattern of eye twitching that occurs during it. The sleep is also when we tend to have episode dreams.

Ginell et Al: Test to see the role that REM sleep plays in the acquisition of new knowledge. Rats were trained to run a complex maze over numerous days. Their time was recorded each time. The rats were then either allowed to sleep normally (REM) or go through surgery that prevented them from entering REM, but the rest of the sleep was unaffected. They discovered that the rats that were prevented from entering REM learned the maze slower than the other rats.

Brain Development: The older we get, the less time we spend in REM sleep. Infants spend 70% in REM, 6 months old spend 30%, 8 year olds spend 22% and adults spend 15%. One theory is that REM sleep doesn’t help consolidate memories, but rather allows time for the brain to reshape and develop new neural connections. This could be proven thorough the amount of time infants (who’s brains are rapidly developing) and adults (almost fully developed) spend in REM.

Mirimiran: Study to determine what would happen to the development of the brain if REM sleep were suppressed. Rats were raised from birth to death, but half of them were injected with a drug the suppressed REM sleep. Once they died, their brains were measured and the once with suppressed REM sleep had a smaller forebrain.

Marks et Al: Similar to the Mirimiran experiment, but with use the use of kittens instead of rats. In adulthood, the cats that were injected with the drug that prevent REM sleep were shown to have underdeveloped occipital lobes.