

Making Neuroscience Fun

A Brain Awareness Program for All Ages



Brain Health: It's SPECTacular

Story General Information

Sleep Basics (🧠 A Physical Health Story) (3rd Grade – 8-9 yrs.)

This story describes sleep, what it is, how it changes over time and most importantly, why you do not act out your dreams.

- 🧠 There are different stages of sleep that do different things.
- 🧠 People have different sleep needs based on their age. Babies sleep from 14-17 hours a day (and there are only 24 hours in a day!), while older people, like your grandparents, may only sleep between 6-8 hours a day.
- 🧠 We have 2 kinds of dreams, the ones that are more realistic and occur during SWS (slow wave sleep) and the ones that are more bizarre and occur during REM (rapid eye movement). Your brain has a way to protect you from acting out your dreams that occur during REM sleep.

The facilitator begins with an introduction of themselves, neuroscience, and an overview of the program, Brain Health: It's SPECTacular. In this story, the focus is Physical Health. Knowing more about how the body physically works can help the brain stay healthy. The children learn about the importance of sleep, sleep cycles, and the functions of the brain during sleep in this story. Sleep is a key component of Physical Health, but also improves Social, Emotional, and Cognitive Health.

All animals, including humans, need sleep to rest their bodies, but the brain continues to work. Scientists know the brain works during sleep because they can record and monitor the neuron communication in the brain through devices called electrodes. This is called an EEG. The children look at images of children undergoing a brain scan with the electrodes attached to their heads to help visualize how scientists learn about the brain while the body is sleeping.

The facilitator introduces the children to the important functions the brain completes during sleep: cleaning and storing information. These each occur during a different type of sleep activity: Slow Wave Sleep (SWS) and Rapid Eye Movement (REM). Both are imperative for the brain and body functioning and performing at their highest level.

The children discuss the effects on the body when the amount of sleep is inadequate. The immune system, which fights off infections, is one major system affected when the brain and body are unable to repair itself overnight. A lack of SWS hinders the body's ability to remember, defend against, and attack germs. The world is full of germs so the right amount of SWS keeps the body and brain healthy.

Ensuring a "good night sleep" means understanding how natural sleep cycles occur. The period of SWS and REM during a sleep cycle shift throughout the night. Lack of sleep means the body will default to more REM sleep than SWS. Therefore, the brain does not have efficient time to "clean" and "repair" itself from a long day of work. The brain and body depend on REM sleep for survival. Memory storage occurs during REM. It allows the brain to remember important information, while forgetting unnecessary facts or knowledge. The facilitator provides an example about a zebra remembering a lion is dangerous. If it does not remember that a lion wants

to eat it, there is no need for a zebra to have a strong immune system to stay healthy. This illustrates to the children the need for REM sleep or survival tactics over SWS or cleaning and repair.

The children also reflect on the amount of sleep needed for different age groups of people. They identify the need for more sleep based on growth and development. Babies are growing and developing at a much quicker pace than their parents. Therefore, babies sleep most of the day. Their brains need much more time to clean, repair, and store new memories. Adults are not growing like babies and children; therefore, on average, six-eight hours of sleep is efficient for their brains to do work. Everyone needs more time in SWS than in REM.

The facilitator and children discuss how to establish healthy sleep habits. Together, they list ideas for creating a bedtime routine to support the appropriate number of hours of sleep each night. The facilitator encourages behaviors such as a regular bedtime and limit or eliminate use of electronic devices prior to bed.

Not only is the brain working during sleep, but it is also dreaming. Dreams occur during SWS and REM sleep. Just as the brain completes different tasks during each type of sleep activity, the dreams during each are also different. Realistic dreams occur during SWS and during REM is when unusual or unrealistic dreams happen. People often do not know they dream because they do not wake during them. The brain also protects the body during dreams. In REM sleep, the body becomes inactive or unable to move voluntarily. This keeps people from acting out their dream as it is occurring in their brain.

In closure, the facilitator reviews the different types of sleep, the functions of the brain during each, and emphasizes the importance of good sleep habits. The children are encouraged to remember and implement these helpful habits so their brains can work, and their bodies can function properly to enhance their Physical Health. A well-rested, fully functioning physical body and brain is SPECTacular!

Story Objectives:

- Students will explain why sleep is necessary for overall Brain Health.
- Students will identify the different types of activity that occur during sleep (REM/SWS).
- Students will describe how REM & SWS benefit the body and brain.
- Students explain why too little or too much sleep can be harmful.
- Students will identify how many hours of sleep is healthy for their age.
- Students will describe what good bedtime habits look like.
- Students will compare and contrast dreams during SWS and REM.