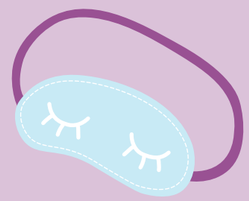
May 2023

# Sleep and learning

## Why do we sleep?

**Sleep is a key medicine for:**

- Willpower and resilience
- Immune boost
- Metabolism boost
- Cognitive enhancement
- Physical health
- Emotional stability
- Stress relief
- Trauma release



Students' sleep habits are significantly associated with academic performance and **GPA** - with nightly sleep duration predicting GPA (Creswell et al., 2023).

During sleep, humans cycle through **REM** (rapid eye movement) and **NREM** (non-REM) phases.

Current theories hold that memory consolidation is occurring during both the REM and NREM phases of sleep – **making sleep essential for learning and memory encoding** (Leminen et al., 2017)..

## Improving sleep

- **View sunlight** within 30 mins - 1 hr of waking.
- Wake up at the same time each day and go to bed when you **first start feeling sleepy.**
- **Dim lights** at night.
- Keep your room **cool** and **dark** in the night time.

If you must choose between exercise and sleep - **choose sleep**!

## Key elements of a full night's sleep

**Sleep-duration**

Adults 19 years of age and older should get **seven or more** hours of sleep a night (Nelson, 2021).

**Sleep quality**

Quality can be gauged at home by looking at how satisfied you are with your sleep (Nelson, 2021).

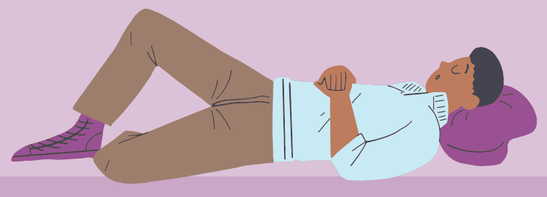
Consider:

- Sleep efficiency
- Sleep latency
- Wake after sleep onset

**Sleep consistency**

It is valuable to **maintain a regular sleep schedule.**

Aim to sleep and rise at around the same time of day as well as get around the same amount of sleep each night (Chaput et al., 2020).



**Definitions**

**Sleep efficiency**:

The ratio of amount of time asleep to amount of time in bed.

**Sleep latency**:

The amount of time it takes to fall asleep.

**Wake after sleep onset**

The amount of time it takes to “properly wake up”.



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# A full night's sleep: memory and attention

## Memory

Students need to be sleeping well **consistently**. If sleep duration and quality are poor when information is first learned, sleeping well the night before the exam will not be enough - grades will suffer! (Okano et al., 2019).

It is also important to be well-rested **before learning new material** (Walker, 2009).

## Attention and concentration

A study following sleep-deprived adults found **sleep-deprivation** to result in **slowing** of **reaction speeds**, **lapses of attention,** and **decreased efficiency** (Hudson et al., 2019).

# Napping: guidelines and benefits

**Strategic nap-taking** during the day can also support learning.

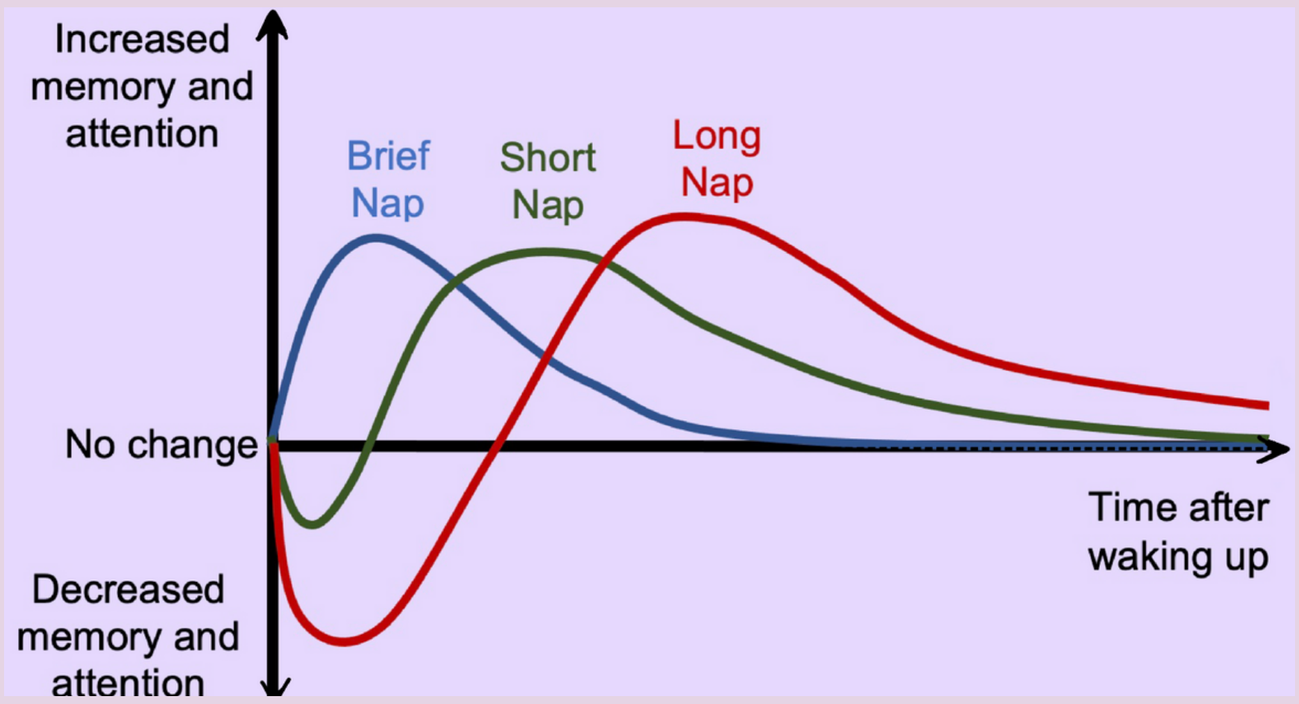


Image adapted from Lovato & Lack, 2010

The length of your nap will bring unique benefits and drawbacks (Lovato & Lack, 2010).

**As nap length increases**:

- Benefits will last longer (i.e., you will feel alert for longer overall).
- Initial impairment will be greater (i.e., you will wake up feeling groggier for longer).

**Caveat**: naps over 90 minutes are generally **not recommended**; they can interfere with a full night's sleep.

## Memory

When studying up to a week before an exam, **napping between study sessions** results in significantly **improved academic performance** compared to students that continue cramming between study sessions or take passive breaks such as watching a movie (Cousins et al., 2019).

Long naps (>1 hour) produce improved cognitive performance for **up to three hours** (Lovato & Lack, 2010).

## Attention and concentration

This study found that brief naps of **just 5 – 15 minutes** result in immediate marked increases in alertness and attention (Lovato & Lack, 2010).



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