



EBOOK

SLEEP AND LEARNING





Sleep is essential for overall well-being. When we sleep, the brain and body can recover, repair and recharge. Less commonly known is that sleep is vital for learning, and without enough sleep, students can impair their academic progress.

It is recommended that teenagers get between 8 and 10 hours of sleep per night, slightly more than the 7 to 9 hours adults need. However, a worrying number of students have reported that they are getting much less than that. Although there may be many factors that influence this, students may be underestimating the importance of a good night's sleep.

Here's a short but complete guide to the benefits of sleep on learning, well-being and academic performance...

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SLEEP AND BETTER GRADES

[Research has consistently shown](#) a positive relationship between sleep and academic achievement. For example, [one study](#) which gave university students activity trackers to measure their sleeping habits found that the quality, duration, and consistency of sleep correlated with better grades.

Consistency is a particularly interesting one. In the above study, having a good quality sleep the night before a test made no difference to academic performance – the largest differences they found were when students had a good quality sleep throughout the week or month before a test.

The impact of sleep on grade improvement can be attributed to the role it plays in learning, memory and other cognitive functions that we explore in greater detail within this guide. For students to reap the benefits of better grades and improved cognitive functions, it is crucial that they engage in all stages of the sleep cycle.

And after all, which student doesn't want better grades? Especially if it requires them to do less and rest more?

Recommended reading:

- [Why sleep quality, duration and consistency matter](#)
- [Sleep – A powerful revision technique](#)
- [Why healthy sleep is crucial for academic success](#)

HOW SLEEP CYCLES FACILITATE LEARNING

There are [two cycles of sleep](#) that repeat throughout the night one after the other: Rapid Eye Movement (REM) sleep and Non-Rapid Eye Movement (NREM) sleep.

NREM comes first and has three stages:

- Stage 1 occurs when we are trying to sleep, but it would be easy for someone to wake us up.
- Stage 2 occurs when we enter a light sleep. Here, the brain produces waves called “[spindles](#)”, which are thought to play a role in memory and learning.
- Stage 3 is deep sleep. At this point, the brain produces very slow brain waves which allow the brain to [recall any activity from the day](#).

The next cycle is REM sleep, which occurs after approximately an hour of sleep. Not only are we likely to experience vivid dreams at this point, but essential parts of the brain associated with learning are stimulated.

The brain also sorts out which information gets [committed into long-term memory](#) during both REM sleep and the deep sleep stage of NREM sleep. When REM sleep is cut short, this can [impair long-term](#) memory for students and in turn damage their capability to learn.

Recommended reading:

- [Can sleep help you learn? Here's what research has to say](#)
- [Strengthen your brain by resting it](#)
- [The impact of sleep on learning and memory](#)

SLEEP AND MEMORY

The cycles of sleep allow [neurons in the brain to recover](#) so that they can coordinate with each other. When students are sleep-deprived, their neurons malfunction, which means that their cognitive functions cannot work properly.

A wide range of research, including research on sleep cycles, has shown that sleep plays a vital role in memory. It appears that [combining sleep with spaced revision](#) (a strategy which involves spreading out study sessions over a longer period of time ahead of an exam) can maximise this relationship.

[Research findings suggest](#) that students who use [Spacing](#) and then have a good quality sleep between study sessions have a better long-term memory of the content. In addition to this, students who have good-quality sleep between spaced study sessions need less study time than those who have poor-quality sleep between sessions.

This suggests that if students are going to make the effort to use highly effective studying strategies like Spacing (and they should), they may boost their results even further by having a productive sleep schedule, thus seeing major improvements in their memory.

Recommended reading:

- [Spacing and sleep: The perfect recipe for revision?](#)
- [15 ways to maximise memory](#)
- [The benefits of a good night's sleep](#)

SLEEP AND INSIGHT

Sleep has also been associated with [better insightful thinking](#), another essential cognitive function for students. A notable example is when pharmacologist, Otto Loewi [had a dream](#) about an experiment that was essential to his Nobel Prize-winning theory that allowed us to better understand how nervous systems work.

But what does insightful thinking mean for students? It is when things finally “click” in their minds and their understanding of content is more secure – otherwise known as [an Aha! moment](#).

For example, [one insightful study](#) (no pun intended) gave participants a task with a hidden rule. After completing the task, they either slept at night, stayed awake during the night, or stayed awake for 8 more hours during the day. When these participants were retested, more than twice as many members of the first group figured out the rule compared to those who stayed awake.

So, sleep can give students a greater awareness of underlying rules and patterns that are less obvious. This allows them to better understand more complex concepts, spend less time getting frustrated at tricky tasks, and think more creatively.

Recommended reading:

- [8 hacks to improve your focus](#)
- [What lack of sleep does to your mind](#)
- [Effect of sleep deprivation on attention and mood](#)



Another vital cognitive function impacted by sleep is attention, which probably comes as no surprise. [A wealth of research](#) has shown that alertness and attention decrease during sleep deprivation, so students end up struggling to focus when they don't have enough sleep. Their ability for logical reasoning is also impaired when they are sleep-deprived, as it is harder for them to pay attention to detail in order to link ideas together in a sensible way.

Attention is the first step to success, as it allows students to tune out any irrelevant information and focus on what they are learning about. When they concentrate on new learning material, they can process it in [working memory](#) and eventually memorise it. But if they can't pay attention in class due to lack of sleep, then it is pretty much guaranteed that they won't remember the information as they didn't engage with it in the first place.

[A fascinating experiment](#) included secondary school students sleeping for only 5 hours a night for five days. Then they were given two days of "recovery sleep" where they could sleep for 10 hours. These students found it difficult to sustain attention and were sleepier than usual. Despite reporting less sleepiness after the recovery sleep, they still had attention deficits. Which bring us back to our earlier point: students need a consistently good sleep schedule rather than relying on the weekend for them to sleep in and "catch up on sleep".

Recommended reading:

- [8 hacks to improve your focus](#)
- [What lack of sleep does to your mind](#)
- [Effect of sleep deprivation on attention and mood](#)

HOW SLEEP IMPACTS EMOTIONS

Managing emotions is already a tricky task for students as their prefrontal cortex is still in development, and does [not fully develop until they are 25 years old](#). This part of the brain plays a key role in emotional regulation and cognitive functioning. However, when students do not get enough sleep, this hinders their prefrontal cortex development and makes it even harder for them to control their emotions.

[Recent research](#) has demonstrated that lack of sleep leads to deficits in emotional processing. This explains why adolescents with poor sleep habits are more at risk for the development of anxiety, mood disorders, and behavioural issues.

This is of course about student well-being, but also more: when students are in a bad mood, their [ability to acquire and retain new information](#) is reduced, making it harder for them to learn. Therefore, sleep ensures that students are in the best frame of mind to achieve.

Recommended reading:

- [Sleep and mental health](#)
- [How sleep affects your emotions | Sleeping with Science, a TED series](#)
- [When the going gets tough, have a nap](#)

SLEEP AND STRESS

On the note of well-being, students often find it difficult to manage their stress levels, especially during exam season. Thankfully, sleep is a simple and effective way to reduce this stress.

[Research in sleep deprivation](#) shows a strong relationship between a lack of sleep and elevated stress levels in students. The hormone cortisol is associated with stress and increases alertness. A poor sleeping schedule can make someone's [levels of cortisol rise](#) at times when they are supposed to be low, which may cause students to be hypervigilant at times when they should be relaxed.

But [stress isn't always a bad thing](#) – in small amounts, it helps students stay engaged and keep complacency at bay. And unfortunately, sleep deprivation doesn't just send cortisol levels up when they should be low – it also does the contrary, which isn't as good as it sounds.

[One study found](#) that 24 hours of sleep deprivation can lead to reduced levels of cortisol the next morning, which is when they are supposed to be at their peak. The result was a lack of attention and alertness in the morning. As students have a strict school schedule to follow each day, it is essential that their cortisol levels are where they are supposed to be depending on the time of day.

Studies have also shown that [stress reduces sleep quality](#), create a vicious cycle that's hard to escape. When students reduce their stress levels they can have better sleep, and good quality sleep helps to reduce their stress, making a consistent and positive sleep schedule all the more important.

Recommended reading:

- [Students: Managing your mobile phone at night](#)
- [6 ways to reduce stress](#)
- [Cortisol and sleep – Your top questions answered to help you achieve healthy stress hormone levels](#)

BUSTING FIVE COMMON SLEEP MYTHS

So, to summarise everything we've said so far: from keeping stress levels where they should be to maximising the effect of study strategies, good sleep is paramount to students' learning, well-being and performance.

So, why do they struggle with it so much?

One reason is that it can be easy to fall victim to false beliefs about sleep due to a lack of knowledge on how it really works. Unfortunately, there are many sleep myths to blame for our national sleep crisis. So, here are five of the most common sleep myths and what you should believe instead...

You can “catch up” on sleep on the weekends

Unfortunately, this is not the case. Even if students feel well-rested after sleeping in on the weekend, it can take much longer for them to fully recover from sleep deprivation. [Research suggests](#) that it can take up to four days of recovery sleep to account for just one hour of lost sleep.

Students can make positive long-term improvements by slowly increasing the number of hours of sleep they get per night. Encouraging students to keep a sleep diary can help them to do this, as they can monitor their sleeping habits to see where they could make positive changes. [Here's an example](#) by the Sleep Foundation which only takes a couple of minutes to complete.

Students are choosing to stay up late and that's why they don't get enough sleep

It can be easy to blame students for staying up way past their bedtime, but changes in their biological systems can mean that they stay up later than they should. During puberty, teenagers experience a [shift in their circadian rhythm](#), which is the body's 24-hour clock controlling when we should sleep and wake up.



This shift means that it's harder for older students to go to sleep at an earlier time, and therefore make it harder for them to wake up early in the morning.

Naps make up for a loss of sleep

Naps are not inherently bad and can help give students a burst of energy if they're feeling tired. However, they are not a long-term solution to sleep deprivation, so students should avoid relying on naps to make up for any hours of sleep that they've missed. It can also be tempting for students to nap for too long. So, it is best for students to prioritise positive sleeping behaviours instead of viewing napping as an alternative to a good night's sleep.

The time you go to bed doesn't matter if you're getting enough sleep

This myth has everything to do with the body's circadian rhythm, which is influenced by levels of light in the surroundings. Having a specific bedtime at night and waking up in the morning will help align the body's 24-hour clock with the environment to ensure that students get a [good quality sleep](#). This is why it's best for students to avoid exposure to artificial light close to bedtime as this can [shift the sleep cycle forward](#), leading students to go to bed later.

Plus, school starting at a certain time in the morning vastly limits the time students can realistically go to bed to get their 8 to 10 hours...

Hitting the snooze button helps you get extra minutes of good quality sleep

Although the snooze button feels like a great solution for getting those extra 5-10 minutes of sleep before starting the day, it is a [harmful habit](#). Those extra few minutes of sleep aren't the best quality, so it's best to wake up rather than disrupting the sleep cycle.

Hitting snooze may also result in oversleeping, which is unproductive and can make students feel tired during the day.

Recommended reading:

- [Does starting school later lead to better grades?](#)
- [CU Boulder lack of sleep study](#)
- [Sleep Health Foundation – Napping](#)

CORRECTING COMMON SLEEP MISTAKES

Although getting in enough hours is essential, having a good night's sleep is more than just getting the recommended number of hours per night. Many students are unaware of how certain daytime and nighttime behaviours impact their quality of sleep, meaning that they incorporate poor sleep habits into their lifestyle.

Here are some examples of common sleep mistakes, with suggestions of how students can avoid these...

Pulling an all-nighter to study

Instead of staying up all night to cram revision, students will find it much more helpful to prioritise getting their recommended hours of sleep each night – especially during exam season.

[Research has shown](#) that students who got at least 8 hours of sleep consistently throughout their exams outperformed those who didn't.

Simply aiming to get their 8 hours leading up to their exams can do wonders for students' results – much more than cramming can. On top of harming their sleep, cramming stresses students out and doesn't actually allow them to learn and retain information, [even if they think it works](#).

Napping close to bedtime

Although napping can sometimes be a helpful tool, if students nap too late in the day or in the evening, they'll feel less tired when it is time for them to sleep. Then, they may have a greater urge to stay up later, which can disrupt their sleep schedule. Instead, if they must nap, they should aim to do so in the afternoon so that they actually feel tired when bedtime comes.

Being on the phone in bed

At night, the body releases the hormone melatonin to relax itself in preparation for sleeping. However, the blue light that is emitted from a phone [disrupts the production of melatonin](#) by tricking the brain into thinking that it is daytime, causing students to stay up later. [The National Sleep Foundation](#) recommends stopping phone usage at least 30 minutes before bedtime, so students can aim to follow this rule to help them sleep better. It may also be useful to use a red light filter in the evening, which is built-in on most phones these days.

An inconsistent sleep schedule

Going to bed at a different time each night can confuse students' circadian rhythm, which controls when they sleep and wake up and reduce their sleep quantity and quality as a result. Instead, students should stick to a consistent schedule (yes, even on the weekends) so that they can reap the benefits of sleep.

Tossing and turning for too long

Sometimes, falling asleep is easier said than done. If students are finding it difficult to sleep, instead of tossing and turning, it is better for them to get out of bed and do something that will use some brain power. For example, doing a [jigsaw puzzle](#) or reading a book can be helpful if students aren't sleeping within 20-30 minutes of putting their head on the pillow.

Drinking caffeinated drinks in the evening

Drinks such as tea, coffee and energy drinks increase alertness. Drinking these before bed will keep students awake at the time when they want to fall asleep. Since these usually take about 20 minutes to kick in, it's best for students to drink these as early in the daytime as possible and in moderation.

[Research has also shown](#) that drinking caffeinated drinks up to 6 hours before bed can reduce sleep quality. Instead of relying on caffeine, students can [incorporate light exercise](#) into their routine to get an energy boost, which will improve their sleep quality instead of reduce it.

Recommended reading:

- [9 common sleep mistakes](#)
- [5 common mistakes to avoid the night before an exam](#)
- [5 reasons why pulling an all-nighter is a bad idea](#)

HOW PARENTS CAN HELP

At the end of the day, it's up to the students to make the necessary changes to their sleeping habits. But there are ways that parents and guardians, who are best placed to help them, can guide them along the way.

Incorporating good sleep hygiene in the household can help students improve their quality of sleep. Sleep hygiene refers to the positive habits and environmental changes that enhance sleep health. Practical strategies include limiting use of electric devices for the household in the evening, eating dinner a few hours before bedtime and dimming the lights in the house in the evening.

Ultimately, it's all about creating routines and setting a good example.

Recommended reading:

- [What parents need to know about sleep](#)
- [The best two gifts you can give your children](#)
- [Helping kids get enough sleep: Tips to share with parents](#)

HOW TEACHERS CAN HELP

Teachers can help students to have good sleeping habits by educating them about sleep in the classroom.

Academic courses such as the [Sleep Treatment and Education Program \(STEPS\)](#) have had successful results. In this particular program, one group of university students were given a 30-minute oral presentation and handouts teaching them about the importance of sleep. Overall, students who did the program had improved sleep quality and sleep hygiene 6 weeks later compared to those who did not do the program.

So, giving students awareness of what sleep really means for them is a cost-effective way help to improve their habits over time. Therefore, teachers can educate younger, as well as older year groups so that they can develop productive sleeping habits well in advance of high-pressure exam seasons – with the help of this guide, hopefully!

Recommended reading:

- [Sleep recharges you: Educator resources](#)
- [How to keep classroom sleepers awake](#)
- [We need to teach pupils the importance of sleep](#)

FAQ

How much sleep do students really need each night?

This [depends on their age](#). Younger students between 6–13 years old are recommended 9–12 hours, and students who are 14 years old and above, the recommendation is 8–10 hours.

What can students do if they are struggling to sleep?

Apart from applying positive sleep hygiene habits, they could try [various relaxation techniques](#) to destress their bodies and minds. If they are consistently unable to fall asleep despite applying good sleep hygiene habits and doing relaxation techniques, they may need to consult their GP.

How do I know if my students are sleep-deprived?

Some signs include a lack of energy, constantly feeling tired or irritable throughout the day, an inability to focus, difficulty staying awake during lessons, and reduced memory or attention.

Should students nap more than once a day?

It's best for students to nap no more than once a day. If they nap multiple times a day, they'll feel tired most of the day, which reduces their productivity. If students feel the urge to nap more than once a day, this may be a sign that they are sleep-deprived.



We have published a range of blogs that can help students gain greater awareness of how to improve their quality of sleep, and how this can support their learning. Here are some of our favourites:

- [Can napping help learning?](#)
- [The perfect way to wake up](#)
- [Is it really just about getting more sleep for students?](#)
- [Sleep your way to success](#)
- [The eight-hour sleep challenge](#)

Here are some extra resources that we recommend:

- Two books that give an in-depth, yet comprehensive, insight on sleep include [Night School: Wake Up to the Power of Sleep](#) by Richard Wiseman and [Why We Sleep](#) by Matthew Walker.
- The National Sleep Foundation have a variety of articles, including [Healthy Sleep Tips](#), which give a wealth of advice on how to improve sleep quality.

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