the Study Formula:

a Guide to the Perfect Study Environment

Creating the Perfect Environment to Learn, Understand, and Remember More Than You Ever Thought Possible.

Written by: Vicki Kunkel / Edited by Carly Walker

What are the perfect study conditions to ace that exam or remember that critical piece of information?

We've done some research to find out just what your brain needs to absorb and remember facts, figures, and fine points. As it turns out, there are six elements to the ***Ideal Study Formula.***

THE PERFECT TIME

Problem Solving in Your Sleep

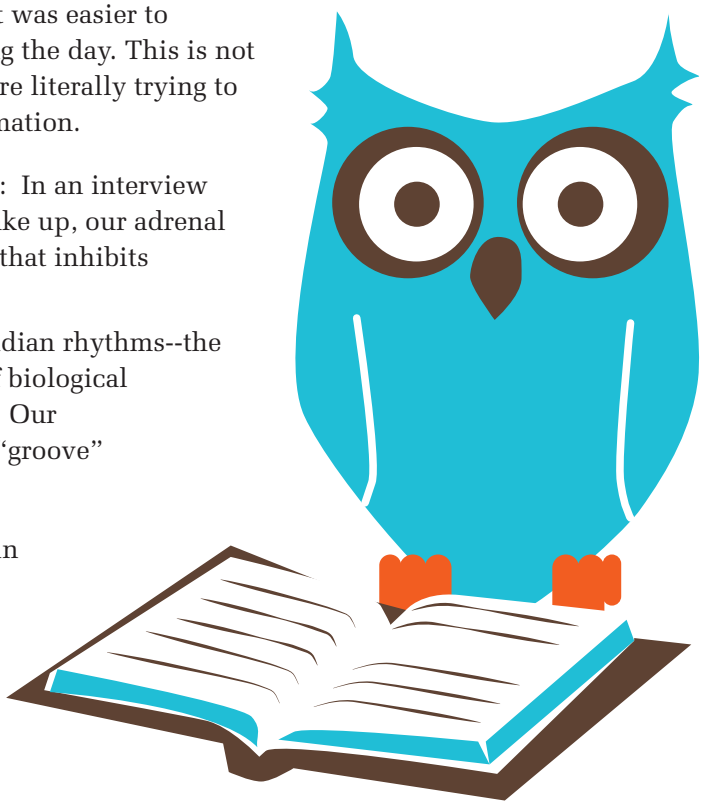
Have you ever had an intense study session right before you went to sleep for the night, and then dreamed about bits and pieces of the information? Well, that was your brain at work trying to analyze and make sense out of the late-night data dump. Several studies back up the idea that sleep is more than just a time when you go into a slug-like state; in reality, it's a time when your brain is very active processing information and problem-solving.

A University of Lubeck (Germany) study found that people who were given a mathematical puzzle to solve right before bed were twice as likely to find a solution to the problem after getting a good night's sleep. But other participants who also got a good night's sleep and were given the mathematical problem the next day didn't have the same success rate as the group that "slept on it."

Become a Night Owl: We learn best in the evening.

The time of day definitely affects your ability to learn, according to another study by researchers at the University of Adelaide in Australia. Physiotherapist-turned-scientist Martin Sale and his team found the brain learns best in the evening. (Yay night owls!) The reason apparently has to do with cortisol levels.

In his research, Sale artificially rearranged the brains of his study participants by stimulating the motor cortex—the part of the brain that controls movement. He was trying to get the brains of his subjects to learn a new motor skill. What he found was that it was easier to reorganize someone's brain at night than it was during the day. This is not unlike what we are trying to do when we study: we are literally trying to change and rearrange our brains to absorb new information.



Sale maintains the implications for learning are clear: In an interview with Australia's Herald Sun, he stated, "When we wake up, our adrenal glands release a surge of cortisol, the stress hormone that inhibits memory and learning."

These cortisol levels are also closely tied to our Circadian rhythms--the 24-hour sleep-wake cycles that direct a wide range of biological functions--including our ability to learn new things. Our bodies and brains seem to be less stressed—and in a "groove" to study -- in the evening.

Study right before bed (the optimal time for your brain to absorb new information), and your brain will be hard at work all night processing the information so you'll be sharp as a tack on your test the next day. Just make sure you have good sleep habits.

SLEEP SMARTER

Just jumping into bed and getting some shut-eye won't guarantee you'll wake up smarter. When, how, and how much you sleep also determine how effectively your brain processes your pre-bed study session.

Go to bed and wake up at the same time every day. Yeah, I know. You're a student. You're busy. You may even have to care for family members. Time just seems to get away from you. But if your bedtime gets away from you, so will your cognitive functioning.

According to sleep experts at the University of Maryland, our bodies get used to going to sleep at the same time. If there is no "set time," then we have a harder time falling asleep, and don't sleep as soundly once we do drift off to dreamland. That means our brains can't process information as efficiently while we're sleeping.

EFFECTS OF SLEEP ON
CAPACITY TO USE BRAIN

"TOO LITTLE OR TOO MUCH SLEEP CAN AGE THE BRAIN UP TO 7 YEARS"

Sleep the right number of hours. How much sleep do you need? Eight hours? Nine? Six? In my family, that has been the source of heated debate over the years. But now a University of London study seemingly can put our bickering to bed: Researchers say seven hours of sleep makes you smarter. (Or, at least they say that's the number of hours of sleep that resulted in the highest score for cognitive measure.)

People in the study who slept more or fewer than seven hours scored lower on tests for memory, reasoning, vocabulary, and verbal fluency tests (psychological tests where participants have to say as many words as possible from a given category in a set amount of time). This same study also showed that sleeping too little or too long not only disrupts how we think, but can age the brain up to SEVEN YEARS!

Schedule sleep to align with your brain's sleep cycles. Scientists at the Center for Applied Cognitive Studies say it's not how much sleep we get that makes us smart, but rather the number of complete sleep cycles we enjoy. Each sleep cycle lasts roughly 90 minutes and contains five distinct phases. Each phase exhibits different brain-wave patterns, and it's important for the brain to cycle through all the patterns in all phases. The worst thing you can do is to wake up in the middle of one of those cycles; if you do, the researchers say you'll be groggy and your mind will be foggy.

90 MINUTE SLEEP CYCLE

WAKE UP EVERY 90 MINUTES AND CHANGE YOUR LIFE

They claim sleeping in multiples of 90 minutes will change your life. According to the study:

"...One sleep cycle lasts, on average, 90 minutes: 65 minutes of normal, or non-REM (rapid eye movement), sleep; 20 minutes of REM sleep (in which we dream); and a final 5 minutes of non-REM sleep. The REM sleep phases are shorter during earlier cycles (less than 20 minutes) and longer during later ones (more than 20 minutes). If we were to sleep completely naturally, with no alarm clocks or other sleep disturbances, we would wake up, on the average, after a multiple of 90 minutes–for example, after 4 1/2 hours, 6 hours, 7 1/2 hours, or 9 hours, but not after 7 or 8 hours, which are not multiples of 90 minutes."

--Center for Applied Cognitive Studies (http://centacs.com)

One final note on sleep cycles: If you think you can sleep four-and-a-half hours and be good to go for the other 19 ½ hours in the day, you're mistaken. The researchers say if you're not able to get seven-and-a-half hours of shut-eye at night, then you must take at least one 90-minute nap throughout the day.

Combining the research from the University of London study and the Center for Applied Cognitive Studies research, my bet would be that seven-and-a-half hours of sleep is the magic number for optimum brain functioning.

THE SOUNDS OF SMART: RIGHT TYPE, RIGHT TEMPO, RIGHT VOLUME.

Have you ever noticed how your favorite song can make you feel better? Now, research shows music can make you smarter, too.

The right type of music for studying. Don't crank the heavy metal or rock and roll; research shows Baroque is best for peak brain performance. Scientists at Stanford University, in California, revealed a molecular basis for increased brain functioning with Baroque music—but not other types of music. In the

study, researchers discovered that rats, like humans, perform better on learning and memory tests after listening to a specific Mozart sonata.

Baroque can also slash learning time and skyrocket retention. Renowned Bulgarian psychologist Dr. Georgi Lozanov used Baroque music when teaching foreign languages to students. The students who were "on Baroque" learned the same number of new phrases in one day (about 1,000!) as other students—who did not have the benefit of Baroque—learned in an entire term! In addition, the students exposed to Baroque remembered 92% of what they had learned!

Dr. Lozanov continued the study over several years and found that by using Baroque when teaching, foreign languages can be mastered with 85-100% effectiveness in 30 days, when the usual time is two years. Not only that, but Lozanov's students who learned with Baroque music had nearly 100% accuracy in recalling words and phrases—even after they had not studied the language for four years!

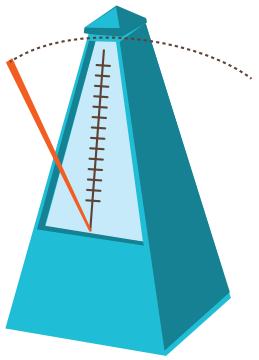
Corporations such as Shell, IBM, and Dupont have also used Baroque music for years to cut learning time and increase retention in their corporate training programs.

What makes Baroque music so special when it comes to studying? It has a structure that triggers more alpha waves on both sides of your brain—allowing you to access the power of your entire noggin—not just your right or left brain! Alpha waves make you calmer, more relaxed, and more creative. When you are in a more relaxed state, your brain can concentrate better and remember more. Our brains are comprised mostly of beta waves—which are great for action and getting things done. But when you study, you want to be in an almost meditative state, and Baroque music gets you there.

The right tempo. All Baroque music activates alpha brain waves and enhances study. But Baroque music played at 60 beats per minute (bpm) has the highest impact because that's the rate at which your heart beats when relaxed, and you learn more when relaxed.

Plato once said, "Music is a more potent instrument than any other for education." Now scientists know why. Music trains the brain for higher forms of thinking.

The right volume. Most studies on using music to enhance learning say it's most effective to play Baroque music so it is just barely audible; any louder and it will create a distraction.



"KEEP THE MUSIC AT 60 BPM JUST LIKE YOUR RESTING HEART"

LOCATION, LOCATION, LOCATION: IT'S NOT JUST IMPORTANT IN REAL ESTATE!

The right study environment can make or break your learning ability. But location is a very personal thing. Some people find they can concentrate better with a little background noise at a place like a coffee shop. Others need complete silence. The type of place you prefer depends a lot upon your learning style. The link below will help you discover your learning style.

http://www.classesandcareers.com/advisor/right-brain-wrong-college/

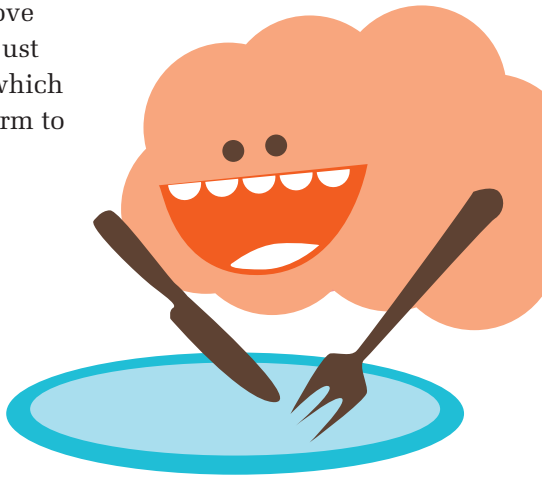
But beyond your learning style, there are a few things to keep in mind when selecting the perfect study environment:

- Surround yourself with "smart" colors. Yellow activates the memory and stimulates the mind in general. (Legal pads are yellow for a reason!) But go easy on yellow; too much of it can make you angry and anxious. A simple yellow highlighter or legal pad is enough. Turquoise is another good color to have around you when you study; it enhances concentration and clarity of thought because it calms the nervous system. Try using a turquoise marker, pen, or note cards as you study.

- Eliminate distractions. Some people can't study at home because they are too tempted to play with the dog, talk with their children, fold laundry (which I could never understand as I put that job off for as long as possible!), or do myriad other household chores. Going to a coffee shop or library where you don't have those types of "in-home" distractions can help you stay focused longer on your studying.

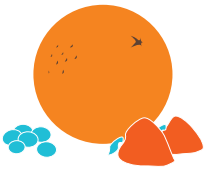
BRAIN FOOD

You may have heard the expression "You are what you eat," and that certainly holds true when it comes to your brain. Certain foods improve memory and help you think more clearly. But one caveat: You can't just eat these brain foods during a cram session. It's a cumulative effect, which means you have to eat these brain-friendly fares daily over the long term to realize the benefits.



Here are seven brain-friendly dietary habits:

1. ***Cut sugar and fat intake.*** That soda or candy bar may give you a temporary surge of energy, but sugar hinders the development of new brain tissue. How? It decreases the amount of a brain chemical called brain-derived neurotropic factor (BDNF). BDNF helps create new brain tissue. Research has shown that high sugar (as well as high fat) diets decrease BDNF and, consequently, decrease learning and memory.

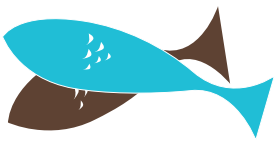


2. ***Get rid of the "brain rust."*** Brain feeling a little rusty? Blame oxidation—the process that causes metal to rust. That same process makes our brains sluggish and our memories fuzzy. Anti-oxidants like vitamins C, E and beta-carotene counteract that "rusting" process in our brains. Almost all berries contain chemicals and compounds that enhance memory and brain functions—and can have our rusty neurotransmitters humming along like a smooth-running engine.

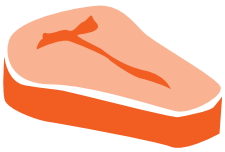
3. ***Eat an apple a day to keep neurodegenerative disease away.*** Apples contain a group of chemicals that could protect the brain from Parkinson's and Alzheimer's, according to two new studies from Cornell University food scientists. One of the researchers involved in the studies, Chang Y. "Cy" Lee, says, "What we found was that the apple phenolics, which are naturally occurring antioxidants found in fresh apples, can protect nerve cells from neurotoxicity induced by oxidative stress," Lee said.

   In other words, it's that rusting thing again.

4. ***Make an eggs-elent choice!*** Eggs get a bad rap. Sure, they increase cholesterol, but egg yolks also contain choline—a substance that helps to build better brains. Choline gives us the mental building blocks to keep our memories sharp.



5. ***Get your omega 3's.*** DHA—an omega 3 fatty acid—is present right in our brains. Getting more of it can help neurons communicate with each other and improve learning and memory. Sources of omega 3 fatty acids include egg yolks, sardines, and other fatty fish like salmon.



6. ***Become and iron man (or iron woman)!*** A lot of research has linked decreased iron and zinc levels with poorer mental performance. In some studies, even marginally low iron and zinc levels reduced adults' ability to concentrate, and slowed the ability to recall information such as words. Sources of iron include liver, lean red meats, sunflower seeds, dried apricots, sundried tomatoes, roasted pumpkin seeds, and many herbs.

7. ***Think like Willy Wonka.*** Flavonoid-rich cocoa improves blood vessel functioning and boosts blood flow to the brain, which can put your brain in power-study mode! Drinking a cup of hot dark cocoa boosts blood flow to the brain for two to three hours. Just be careful not to overdo it; it's the cocoa that is good for you—not the fat and sugar that is in most candy bars and hot chocolate drinks!

Recap the Study Formula:

1. **STUDY** IN THE **EVENING**
2. **GET 7 1/2 HOURS OF SLEEP**
3. **LISTEN** TO BARLEY AUDIBLE **BAROQUE MUSIC** AT **60 BPM**
4. **STUDY** IN A **PLACE WITH MINIMAL DISTRACTIONS**
5. **EAT** THE **SEVEN BRAIN FOODS**

Don’t you feel smarter already?