

QUIT PAYING ATTENTION!

A regular dose of daydreaming could be good for your brain.



by Brittany Moya del Pino

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Ready? Here's your assignment: Watch a series of white, single-digit numbers flash against a black computer screen, each visible for slightly longer than one second. Your job is to press one key when the number 3 appears, and to press a different key for all the other numbers. The computer will respond to your actions with "Correct!" after each appropriate key strike or "Incorrect!" if you make a mistake.

It's easy, right? And it's somewhat fun at first.

But several minutes into this, your thoughts will probably drift from striking the correct keys to wondering how much longer you'll have to keep doing this. Then you might begin thinking about why one of your friends said that weird thing during class today, or what you have planned for the weekend. Meanwhile, your fingers are still pecking away at the keys.

This switch from thinking about the computer task to thinking about other things is called mind wandering, or daydreaming. It's something we're all familiar with because we all do it.

Daydreaming gets you in trouble if you're caught doing it during class, or in the middle of a basketball game, or anything else that requires focus and quick thinking. But here, with the computer task and its flashing white numbers, daydreaming isn't such a bad thing. Experiments like this one have taught scientists when and why our minds naturally wander, as well as how daydreams can boost brainpower.

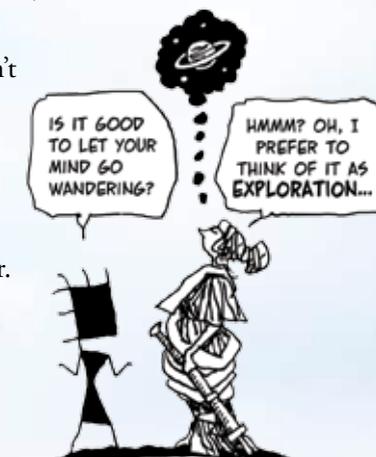
WHERE IS YOUR HEAD?

Scientists have defined daydreams as private, internal streams of consciousness unrelated to our immediate circumstances or external tasks. Put simply, that means that daydreams are thoughts that have nothing to do with what you're doing while you're thinking them.

You could easily daydream, for example, while you're walking home from school on a sunny, quiet afternoon. If the route home is familiar, you don't need to figure out which way to go. Plus it doesn't require much effort to keep your balance and place one foot in front of the other. Instead, your mind is free to contemplate abstract ideas and make meaningful connections, even as you continue your journey.

Our ability to multitask in this way is useful, but it also has drawbacks. Daydreaming minds are disconnected from the outside world and turned inward. So on that walk home from school, it would be hard for you to remember later anything you saw while you were daydreaming. It would also be harder for you to avoid sudden, unexpected sources of danger, like a tree root that causes you to trip and fall flat on your face.

Despite these risks, research has shown that somewhere between one-quarter and half of the average adult's waking day is spent daydreaming. And young people seem to daydream more than older people. If all of us have our heads in the clouds so often, then there must be some advantages. Otherwise, from an





evolutionary perspective, our daydreaming ancestors would have been wiped out long ago.

“Mind wandering can be disruptive in all sorts of contexts,” says Jonathan Schooler, a professor and daydream researcher at the University of California, Santa Barbara. His projects include studies of how daydreaming can affect memory, reading comprehension, mood, and creativity. “I’m interested in trying to find the right balance between the potential costs and the benefits.”

One benefit that he and other researchers have found is that daydreaming can improve creativity and problem solving. In one experiment, Schooler’s group gave volunteers an ordinary object, such as a brick, and asked them to list as many unusual uses for the object as they could imagine. They found that a period of rest, which was usually accompanied by daydreaming, helped the volunteers imagine more creative and zany brick uses: a paperweight, a Barbie gravestone, a snake hole blockade, or the pivot of a miniature seesaw.

Daydreaming also seems to be involved in empathy and social skills. Researchers at the University of Southern California did an experi-



ment that involved telling college students a sad story about a family that didn’t have enough food. When the researchers asked the students how the story made them feel, those who paused to think while they were

answering—perhaps looking at their laps or into space and focusing on internal thoughts rather than on what was happening around them—were able to give deeper, more thoughtful answers. They related the story about the family to their own lives, with connections to their own family experiences and hopes for the future.

Similar experiments have shown that people who daydream more have clearer goals and are better prepared for the future, particularly if they start their daydreams after thinking about their own lives and desires. But beyond helping us to become more creative and emotionally intelligent people, daydreaming gives us time to rest and relax and really think about what’s important to us. And, of course, it’s fun.

WHAT DAYDREAMS ARE MADE OF

Much of what scientists have learned about daydreams has come from experiments that involve attention tasks—asking volunteers to remember images or sounds while solving simple math problems, for example. Periodically, they interrupt to ask the volunteers: “What were you thinking about just now, the task or something else?” This technique is called thought sampling. Meanwhile, right and wrong answers in the task help the scientists confirm whether volunteers are paying attention or their minds are somewhere else.

However, this method is a little bit sloppy because it depends on volunteers telling the truth. Without a machine that can read human thoughts, it’s hard for scientists to be absolutely

sure that what they’ve caught in their experimental net is a genuine daydream.

One fix to this problem involves using brain scans in daydream research. Volunteers can do the attention tasks while lying inside of a huge, tube-shaped scanner called an fMRI machine. This lets scientists see which parts of people’s brains are burning the most energy when they’re concentrating on the task or when they’re thinking about something else. The scans have shown that certain brain areas, which neuroscientists call the “default mode network,” become dominant during daydreams, burning nearly as much energy as our brain’s attention centers do when we’re actually paying attention.

And then there are the eyes. It turns out that our pupil size, our rate of blinking, and the duration of our gaze (the amount of time we spend looking at individual words as we read) can all be clues about whether our minds are in the here and now, or wandering off somewhere else. These signals can also be useful outside of research. Someday it’s possible that cars, airplanes, and more futuristic travel machines will be equipped with technology that monitors our brain activity and eye movements, watching for signs of daydreaming so they can help drivers snap out of it and avoid an accident.

Schooler says that the science of daydreaming is really going to leap forward once he and other researchers can know in real time when people are mind wandering. “We’d like to watch it begin, watch it build up, and watch the whole episode,” he says. “That would be so exciting. That’s the direction we’re moving in.”

Monumental Daydreams

History is full of stories about great scientists, philosophers, artists, and inventors who had world-changing ideas while they were daydreaming.

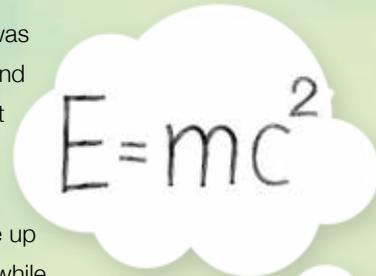
Sir Isaac Newton said that he came up with the theory of gravity while daydreaming in his backyard, when he noticed an apple fall from his tree.



Charles Darwin, the British naturalist who was responsible for the theory of natural selection, built a sandy path around the perimeter of his property in England. Each day he would walk three laps so that he could spend time thinking. Walking is an excellent situation for

daydreaming, particularly walking the same path day after day.

When Albert Einstein was working as a patent clerk and poring over documents that described other people’s inventions (and feeling somewhat bored), he came up with the theory of relativity while daydreaming about chasing a beam of light.



Author Alice Munro, who won the Nobel Prize in Literature last year, said that she used to daydream on her walk to school, imagining a better ending for stories she had already read or daydreaming about new stories that she wanted to write.



And Art Fry, inventor of the Post-it note, thought up his brilliant invention while daydreaming during a church sermon.

THIS WAY TO LA-LA LAND

Daydreamers have a bad reputation for being unaware of what's happening around them. They can seem clueless, forgetful, and clumsy. They stare off into space and wander by themselves, occasionally muttering. They frustrate us because they seem to be ignoring us and missing the important stuff.

But daydreamers are also responsible for some of the greatest ideas and achievements in human history. Without wandering minds, we wouldn't have relativity or Post-it notes—and what kind of world would that be? (See “Monumental Daydreams” on page 33 for more.)

So how can you come up with brilliant daydreams and avoid falling over tree roots or otherwise looking like an idiot?

First, understand that some opportunities for daydreaming are better than others. Feeling safe and relaxed will help you to slip into daydreams. Having interesting things to think about also helps. And if you want to boost your chances of having a creative idea while you're daydreaming, try to do it while you're involved in another task—preferably something simple, like taking a shower or walking, or even doodling. (See “Doodle for Your Noodle.”)

“My recommendation for daydreaming is to just build some free time into your day, when you're doing something pleasant but not very demanding,” Schooler says. “And it's a fine idea to

Do you happily daydream the day away, or do you feel guilty when you get caught spacing out? Have you ever daydreamed a brilliant idea? Share it at musemagkids.com/townhall.

Doodle for Your Noodle

Daydreaming can be good for your brain in some settings, but what about everyone's other favorite classroom no-no: doodling?

One scientist did an experiment where people were asked to shade in squares, circles, and other simple shapes while they listened to a two-and-a-half-minute phone message listing the names of people who were coming to a party. Doodlers were able to remember the names of people on the message 30 percent better than people who didn't doodle. In this case, however, the benefit of doodling seemed to be that it kept people somewhat focused on their surroundings, rather than letting them drift off completely into a daydream.

Beneficial or not, we left the margins around these pages blank to give you room for your own doodles.

find time to just daydream about interesting things while you're gardening, driving on a quiet road, or even doing chores.”

It's also important to know how to avoid daydreams, for those times when you really need to focus. “Mindfulness” is a tool that some people use to avoid drifting off. It involves slow, steady breathing and other techniques for self-control that help people stay calm and alert. (However, fear can also be effective—it's essentially kryptonite for daydreaming.)

A strong interest in what's going on will also help keep you tuned in. When Schooler gives college lectures, he invites his audience members to interrupt him if they have a question (hands raised politely, of course) so that he can answer it right away, rather than leave them confused and contemplating something else while he continues to talk.

Finally, it's a good idea to keep a notebook or voice recorder nearby when you're in the daydream zone, because you never know what brilliant idea might strike while your mind has drifted off.

If you want to build a better engine, figure out how to achieve world peace, or understand how dark energy relates to the universe, you'll definitely need to spend some time with your head in the books. But your best ideas might come when your head is actually in the clouds. 

Brittany Moya del Pino is a science writer and Muse parent living in Hawaii, where staring into space is much more scenic than in most places.

ride it to New York City and build PB&J World Headquarters.

