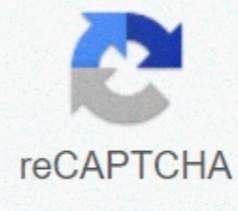




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How do organisms get energy from the sun

Compared to the rest of the universe, the Earth is very small. Our planet and eight (or maybe nine) other orbiting suns, which is just one of about 200 billion stars in our galaxy. Our galaxy, the Milky Way, is part of a universe that includes millions of other galaxies and their stars and planets. By comparison, the Earth is microscopic. Compared to man, on the other hand, the Earth is huge. It has a diameter of 7,926 miles (12,756 km) at the equator, and it has a weight of about 6 x 1,024 kilograms. The Earth orbits the sun at about 66,638 miles per hour (29.79 kilometers per second). But do not look too long; for many people, the Earth is inevitably, mind-bogglingly large. And it's only a fraction of the size of the sun. From our point of view on Earth, the sun looks very small. It's because it's about 93 million miles from us. The sun is insurmountably, mind-crushingly larger. But without the sun, the Earth could not exist. In a sense, the Earth is a giant machine, full of moving parts and complex systems. All these systems need energy, and that power comes from the sun. The sun is a huge nuclear energy source – thanks to complex reactions, it transforms hydrogen into helium and releases light and heat. Thanks to these reactions, every square meter of our planet's surface gets about 342 watts of energy from the sun each year. That's about 1.7 x 10¹⁷ Watts in total, or as much as 1.7 billion large power plants could generate [source: NASA]. You can learn about how the sun generates energy in how the sun works. When this energy reaches Earth, it provides energy for different reactions, cycles, and systems. This drives the circulation of the atmosphere and oceans. It makes food for plants that many people and animals eat. Life on Earth could not exist without the sun, and the planet itself would not have developed without it. For the casual observer, the sun's most visible contributions to life are light, warmth and weather. Now let's see how the sun drives each of them. More than one-third of us inadvertently nod during the day, the CDC says. The most obvious - and common - reason: We don't get enough sleep. But our energy levels depend on factors that exceed seven to eight hours of sweet dreams every night. We can be laid low emotional fatigue, too – by getting bored, by having too much or too little work (or too much stupor-inducing work to go through). Or we (you?) can be surrounded by vampires - and not the sexy Twilight variety. Fatigue often has more to do with emotional than physical, says Sherrie Bourg Carter, Psy.D., codirector of the Institute for Behavioral Science and Law in Fort Lauderdale, FL, and author Tall octane women. Think about it. Even a bad night's sleep wouldn't make you want to meet your best members for a drink after work or go to a banquet to accept the Volunteer of the Year award. Somehow we always find time - and energy - to do things that bring us pleasure. The trick is to build the activities you love into your life, map out a new course that will keep you energized. You will be more productive and you will have more time. Here, from leading experts and research studies, how can you make it happen. Shake it, wake up There's comfort in routine, but living a life in which you do the same thing every day has a dulling and time-debilitating effect. Your brain hates the same old, the same old enough to just shut down. This makes sense from an evolutionary point of view: The brain is involved in ignoring acquaintances and looking for a novel, giving you the kind of internal alarm that allows you to feel the potential danger by tuning in to a likely safe-hum. At the same time, the novelty activates your pleasure system to spew dopamine, one of the brain's good feeling chemicals. Dopamine is largely responsible for your brain lighting up for scans when you satisfy a major desire for food (like when you have to have that chocolate and you get it). But recent research suggests that dopamine is also the raw material of motivation – it gets you and your brain up and eager to go. And if you're in shortfall, you'll feel a kind of mental fatigue. Forget shopping or cooking - even making a list of foods will feel like too much work. You don't have to push the novelty theme too far and take it to skydiving (as my friend Sarah did) to get a dopamine hit. It will make a trip to the forest or afternoon combing the art galleries. Even small tweaks to your routine can be energizing, says Mira Kirshenbaum, Ph.D., co-founder and clinical director of the Chestnut Hill Institute in Boston. Take another trip to work or download some Radiohead (although you may have no idea who they are) to your iPod. This can only help change the images in your cabin, he says. Find your passion or rediscover the old one. If you don't like what you do - work, your hobbies, the causes you've embraced - you're probably dragging your life as if you're always heading for the middle class algebra. In this age of high unemployment, you may not be in a position to ditch your boring job, but maybe you could think of a new project that excites you and convinces your supervisor to give you a try. Studies by Amy Wrzesniewski, Ph.D., associate professor of organizational behavior at Yale, suggest that crafting your work into a profession – something that feels meaningful and gives you a sense of fulfillment – can also help. Maybe you could mentor younger employees or create a charity project for your company. If you can't rejigger your work, you change other things in your life to find the spark you are looking for. Could you continue painting or a local history course? If you know you have to leave the office at exactly 5 P.M. to get to class on time, you will push through your day more efficiently. Dto on weekends: Speed-clean the house in front of the aerobics class, and you get a double burn. If you're stumping about what excites you, check out the bottom of your to-do list, things you're longing to get into after laundry and call the fridge repair and dropping prescription on the drugstore and... Hang with the fun crowd People who live every day with a sense of excitement and energy can pass this attitude on to you so kindergarten classes share the cold. In this case, however, it is a social contagion at work - and it is a good thing. A friend who is excited about her work and her life can help you find your own joie de vivre again. Which also can make you more productive and better able to save your personal days on something other than recovering from the flu; one study found that people who lack the appetite for work are more likely to have long spells of sick leave. Defeat vampires Look around your circle of family, friends and acquaintances. How many of the seven vampire dwarves - Angry, Whiny, Needy, Grumpy, Nasty, Killjoy, and Toxic - are in your life? On Facebook, you can just remove them from your friends. In real life, you have to deal with them. My friend - let's call her Heidi - once hid under the table for five minutes until an office whining businessman, couldn't find her, went on to see if there was anyone else there that could complain. Better to set boundaries, says Judith Orloff, MD, assistant clinical professor of psychiatry at the University of California, Los Angeles, and author of Emotional Freedom. Body language can work with everyone except the terminally self-centered. As the local drama queen approaches, make it clear that you're not interested in turning away a little. Don't ask how it feels or what's new, warns Dr. Orloff. Eventually, he moves on to his next victim - and you can go back to completing the message so you can get to this picture or history class in time. If a vampire is your mother, sister, or old friend, and a gun is a phone, then apparently body language doesn't do it. But loud tongues can. I wish I had time to talk! you can say warmly without explaining to me why not. But can you tell me the rest of the story another time? Add I love you as you hang up, and there should be no hurt feelings. Taking a break recently, I interviewed a tough, respected judge in the city court. At the end of our class together, I asked her one of my favorite Barbara Walters-style questions: What are three things you think people don't know about you? Judge's answer: I'd rather garden; if this fails, I'd rather cook; And I love murder mysteries. There's a woman who vacates on vacation. We all need an occasional recovery, as Jim Loehr, Ed.D., co-founder of the Human Performance Institute in Orlando, FL, and Tony Schwartz, CEO of the Energy Project, call it in their book The Power of Full Engagement. To maintain a high level of energy – to get that 25th hour on the day we were all looking – we need to restore, retool, and restart ways big and small. That means taking vacations and long weekends. It also means banishing work from Saturdays, Sundays and holidays (at least some of the time). Loehr and Schwartz also advocate mini breaks throughout the workday. We think overachieving is more productive, but that's not always the case, says Dr. Orloff. Your mind cannot continue to solve problems indefinitely. And your body needs a break, too. In one landmark study that analyzed data from the Multiple Risk Factors Intervention Trial (MRFIT), people who did not take leave for five years had a 17% higher risk of mortality overall and a 32% higher risk of dying from coronary artery disease during a nine-year follow-up than those who took time away. Sleep and performance also improve after a holiday: Research commissioned by Air New Zealand found that people improved on average nearly 20 minutes of quality sleep after returning home - and their performance levels were 25% higher (based on measurements made in a study with a handheld device that measured wakefulness and reaction time). If it's hard for you to get away, you may have to redefine what it means to get away. A weekend reading a novel or even just a few hours lounging through garden catalogues while sipping herbal tea can give you the break you need. So he can indulging in TV mind candy as a mini marathon project track reruns. One extremely refreshing getaway is meditation – and best of all, you don't have to pack for it. Meditation is a way to calm your body down and dull stress reactions. It can get those endorphins flowing, so you're 20 times more productive during the day, says Dr. Orloff. And it doesn't have to be a long session (see). You can also enjoy the health bonus: While it's very preliminary, research from the University of California, Davis, suggests that regular mindfulness meditation can slow down the rate of cellular aging – potentially giving you a more valuable time than you've ever dreamed of. istockphoto ENERGY NOW! There is always coffee (frequent small shots work better than gobbling grande to charge you), but here are some other quick fixes for a temporary slump: • Nap For best results, nod for 20 minutes between 1am and 3am in the afternoon. Study by UC Riverside researcher Sara Mednick, Ph.D., author of Take a Nap! Change your life, and others have found that a short nap that Before you get into deep sleep it is most refreshing and makes you the most productive later. • Exercise There's nothing like putting on sneakers and heading out for a brisk walk when you're tired. That's right - nothing like that. Many studies have confirmed that walking, jogging, or lifting several weights can counteract fatigue on the spot. Getting rid of it in the long run requires a daily dose of exercise. • Sunlight You know that going out improves mood; a dose of the sun can also ramp up alertness and cognitive agility, a University of Alabama study has confirmed. • Gum Maybe putting this in can't hurt, it can help categories: Research has shown that the act of chewing stimulates blood flow to the brain and also increases brain activity. In one Japanese study, participants who chewed gum twice a day for two weeks reported less mental fatigue than non-chewing gum, and were not as nervous or depressed. HOW BUSY WOMEN FOUND TIME TO HAVE FUN We asked our fans on Facebook to tell us about new activities they've added to their already crowded calendars. Get ready for inspiration: Jennifer Smialek I volunteer for a group that helps the homeless by promoting trust through running. It's hard to get in runs, but the feeling of giving back is wonderful. Apuroopa Tipparaju I give dance classes and now take classes, too. I found time by changing priorities for this day or week. Hannah Tate Franken As a vegan, I live with the stigma of being weak, boring and pretentious. I'm none of this, but I decided to prove it by taking weightlifting. Heather McKenzie Carter I go every week of the Women's Bible to study classes and friendships. I feel so good being with these women. Jenafer Lockwood Haddy My husband suggested I open a craft business. Now, after my busy day with the kids, I spend time doing what I love, and that helps me relax. Three-minute meditation 1. Find a quiet place where you won't be disturbed. 2. Gently place your palm on the heart. Focus on the person, place, song or memory you value. The goal is to feel love and focus it as energy in your middle chest. 3. Visualize all thoughts like clouds drifting in the sky. Let them go and out of your consciousness. 4. Observe feelings in the heart area: heat, coldness, bliss, compassion, release of pressure, vibration. Over time and with practice, you will feel positive energy in your chest that will flow into your body. Taken from emotional freedom by Judith Orloff, MD This content is created and managed by a third party and imported to this page to allow users to provide their email addresses. For more information about this and similar content, see piano.io piano.io