

# THE BUSY SLEEPER

Geek out with this  
fascinating look at your child's brain  
and body on a good night's sleep.

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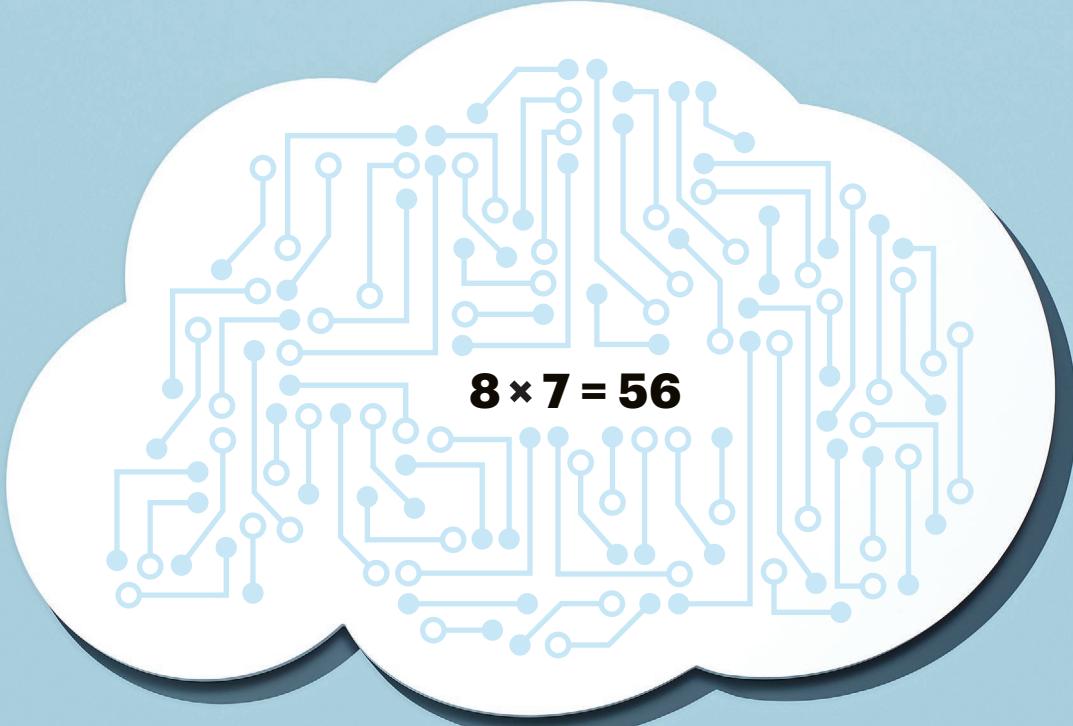
**YOU SIGNED** her up for soccer to keep her active, made time for marathon bedtime reading sessions, and filled her afternoons with playdates. But if you really want to raise a well-rounded kid, you may want to simplify her schedule and just focus on getting her to bed on time. A growing body of research shows that sufficient sleep is critical to a child's physical, cognitive, and emotional health, says Kiran Maski, M.D., a pediatric neurologist and sleep physician at Boston Children's Hospital. "Plus, insufficient sleep has been shown to be a predictor of high blood pressure, obesity, insulin resistance,

mood disorders, attention issues, and more." Take a closer look at all the amazing processes that occur while your little sleepyhead snoozes.

● **She's banking information.**

Sleep is prime time for the brain to transform learned material—How do I move these laces to tie a knot? What's 6 x 3?—into active knowledge. "Think of it as 'off-line' processing. Your child sorts through all the information she encountered throughout the day, gets rid of what she doesn't need, and keeps what she does," says Reut Gruber, Ph.D., a psychologist and director of the Attention

Behavior and Sleep Lab at Douglas Mental Health University Institute, in Montreal. (This is one reason babies are always napping; everything is new to them, so their brain needs frequent breaks to process and sort.) Animal research at NYU Langone Health suggests that during the deep stages of sleep, brain cells involved in learning get reactivated and facilitate the growth of new neural connections, which helps long-term memories form. A study led by Dr. Gruber of kids ages 7 to 11 linked a good night's sleep with higher grades in math and languages—two powerful predictors of later learning and academic success.





Your kid's bed should be his happy place.

## 3 signs your kiddo is sleep-deprived

1

Waking up is a challenge, and he can't seem to "get going" within 15 minutes.

2

She snoozes at least two extra hours per night on weekends and school holidays.

3

He passes out during short (ten- or 15-minute) daytime car rides or at other non-sleep times (school, a sporting event, or other fun activity).

Source: National Sleep Foundation.

### ● He's getting taller.

The next time your 8-year-old wakes you because of pains in his legs, give him some TLC—he's likely sprouting right before your eyes! "We believe that bones do most of their growing at night," says Ken Noonan, M.D., a pediatric orthopedist at American Family Children's Hospital, in Madison, Wisconsin. His research on baby lambs found that the growth plates in their legs don't move much during the day when the lambs are standing, but at night, when they're lying down and the pressure of their body weight is no longer a factor, their growth plates spring open. A similar phenomenon may be at play in humans, says Dr. Noonan. No wonder those dinosaur pj's seem to hang shorter at breakfast than they did the night before. Of course, if your child complains of persistent leg pain, tell your pediatrician.

### ● She's bonding with family and friends.

Dreams are designed, in part, to help us successfully navigate life: They impact cognition, mental health, emotional growth, and so much more. In kids, dreams help promote attachment, says Patrick McNamara, Ph.D., author of *Nightmares*. "Kids certainly dream about their family members, and we think that those dreams facilitate positive emotional interactions when they're awake."

### ● He's keeping his appetite on track.

In a torturous-sounding study led by the University of Colorado Boulder, preschoolers were deprived of roughly three hours of sleep for one day; they got no afternoon nap and were kept up for two hours past their normal bedtime. During that day of lost sleep, the

children consumed 21 percent more calories than usual and 25 percent more sugar. The following day, when sleep returned to normal, they still ate more. Research has found that for each hour-long increase in sleep, the risk of becoming overweight or obese decreases for kids of all ages. In one study of children ages 5 to 11, those who slept less than ten hours each weeknight were more than five times as likely to be overweight compared with those who slept at least 12 hours.

Experts attribute the link to a few factors. First, when kids (and adults) get sufficient sleep, it helps to balance the hormone that tells us to eat (ghrelin) with the one that signals us to stop (leptin). "Ghrelin and leptin are secreted when we sleep," explains Rebecca Scritchfield, R.D.N., the author of *Body Kindness*. "With the proper amount of sleep, our brain produces adequate

levels of ghrelin and of leptin in a combination that gives us normal daytime-appetite regulation.” But with insufficient sleep, ghrelin levels are higher, leptin levels are lower, and your body tells you to eat more than it normally would. Plus, hormones aside, the later your night owl stays awake, the more opportunities he has to raid the pantry.

● **She’s becoming more attentive.**

The phrase “executive function” refers to the set of skills that gets kids through the day, including the ability to focus, manage time, remember instructions, and problem-solve. And it hinges on sleep. “Studies show that when you give cognitive tests to sleep-deprived kids who don’t have ADHD, their performance mimics that of children who have ADHD. In other words, poor sleep quality and sleep loss result in problems with concentration and hyperactivity,” says Lisa Medalie, Psy.D., director of the Pediatric Insomnia Program at The University of Chicago. For that reason, it’s important to rule out sleep problems before making an ADHD diagnosis, says Dr. Medalie.

● **His heart is growing stronger.**

Sleep appears to protect children from high blood pressure, insulin resistance, and other heart-disease risk factors. The mechanism is not well understood, but research suggests that shorter

Age-by-Age Daily Sleep Needs	
AGE	HOURS
4 to 12 months	12 to 16
1 to 2 years	11 to 14
3 to 5 years	10 to 13
6 to 12 years	9 to 12

sleep duration increases levels of an inflammatory biomarker called C-reactive protein, which contributes to high blood pressure and increases the risk of cardiovascular disease, says Elizabeth Cespedes Feliciano, Sc.D., a chronic-disease epidemiologist with Kaiser Permanente Northern California’s Division of Research.

● **Her immune system is recharging.**

A well-rested start to the day keeps the doctor away. At night, your child’s brain releases chemicals that support immune system repair. These include cytokines,

the molecules that direct immune cells to areas of infection or inflammation. A German study was the first to show the specific benefit in humans of a single night of good sleep following a vaccination: Subjects who slept during the night following a hepatitis A vaccine produced nearly twice as strong an immune response after four weeks as those who pulled an all-nighter. Shorter sleep time has also been linked to higher levels of cortisol, a stress hormone that reduces the activation of the immune system, which can get in the way of healing.

● **He’s calming down.**

If you’ve ever watched your exhausted kid melt down after dinner, you won’t be surprised that research shows that sleep-deficient youngsters have more problems getting along with others and are more prone to anger, frustration, and temper tantrums than well-rested ones. What you may not know: If sleep deprivation becomes chronic, a child may also become predisposed to anxiety or depression later. “After just two nights of inadequate sleep, children experience fewer positive emotions in general, as well as in response to happy things, like a birthday party or a good grade on a test,” says Candice Alfano, Ph.D., professor of psychology and director of the Sleep and Anxiety Center of Houston at the University of Houston.

That’s likely because two areas of the brain responsible for emotional regulation—the amygdala and the ventral medial prefrontal cortex—are exquisitely sensitive to sleep deprivation, says Dr. McNamara. These regions interact during sleep, engaging in a dialogue that helps your child process and understand any negative emotions, such as fear or anxiety, that he experienced during the day. “If he got nipped by a dog, the brain needs to process that experience to make sure he can one day approach a dog without fear,” Dr. McNamara explains. “It needs to ‘de-fang’ the memory by reformatting it in a less arousing way.” The result: a child who will be skilled at regulating his emotions not just the next day, but every day. ☒



→ **What about newborns?**

Babies younger than 4 months seem to sleep round-the-clock, yet even they can benefit from higher-quality slumber, says Harvey Karp, M.D., *Parents* advisor and author of *The Happiest Baby on the Block*. Three ways to navigate night wakings:

- 1) **Offer a pacifier.** Sucking can deliver instant tranquility. Plus, using one reduces the risk of SIDS in the first six months of life.
- 2) **Rock her right.** If your baby needs 3 A.M. comfort, try holding her on her side or over your shoulder—two super-calming positions.
- 3) **Mimic the setting he loved in the womb.** Swaddle him (hey, your uterus was cozy!) and play white noise to simulate the sound of blood flowing. Or consider the SNOO (\$1,160; happiestbaby.com), a baby bed Dr. Karp created to respond to cries with noise and rocking, and to keep swaddled babies safely on their back. He’s tracked SNOO babies and seen their sleep condense into nice, long stretches faster than normal. (Psst... We’ve heard SNOO resells in a flash on Facebook.)