

Inside

Chronic fatigue, emotional highs and lows, social pressures, insecurity, poor nutrition, romantic crushes, low impulse control: How does an adolescent get through the school day?

Marilee Sprenger

At 6:00 a.m., the radio alarm goes off. Amy opens one eye, looks at the clock, and presses the snooze button. At 6:15, the radio starts to play again. In a stupor, Amy reaches over and again hits the snooze button. At 6:30, when the alarm goes off for a third time, Amy's mom is standing over her. "Up, young lady! You'll be late for school if you don't get out of that bed right now!"

Amy stretches and pulls the covers up beneath her chin. Just as she's about to snuggle under her blanket, her mom yanks the comforter off and folds it down to the bottom of the bed. Sleepy and chilled, Amy gets out of bed and heads to the warmth of the shower. Play practice until 9:00 the night before kept her up late studying, and then she had to catch up with her friends on the phone.

According to research, adolescent learners need 9 hours and 15 minutes of sleep each night (Carskadon, 1999). Ever since Amy's biological clock changed with the onset of puberty, she has found it difficult to fall asleep before



Amy's Brain

midnight. Unfortunately, her school's starting time—7:30 a.m.—requires that she get up at 6:00. Chronic sleep deprivation makes her cranky.

The shower is soothing and wakes Amy up a bit. She carefully puts on her makeup, fixes her hair, chooses an outfit after some consideration, and heads toward the front door.

"Not so fast!" Mom says. "You need to eat something."

Amy's mom is right. As the only organ in the body that cannot store energy, the brain needs breakfast to jump-start (Wolfe, Burkman, & Streng, 2000). But Amy looks at the food on the table and whines, "I can't eat eggs this early in the morning." She grabs a piece of toast with jelly, picks up her backpack,

and heads out the door before her mother can say another word. She barely makes it to the corner in time for the bus. Plopping down in the seat next to her friend, Samantha, she closes her eyes and tries to doze on the way to school.

Sam, however, has other plans. "Amy, the boy in the last row keeps looking up here. He's really cute. Do you know his name?"

The words "really cute" make Amy open her eyes, sit up straight, and turn around. "That's J.D. Smith. He just moved into our school. He is *hot!*" The girls flash him smiles and chatter for the rest of the ride.

Amy's first class is chemistry. This is Tuesday, so Mr. Porter

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is lecturing. Amy sighs with relief. She has a chance to catch up on her sleep. On Monday, Wednesday, and Friday the class has lab, so she has to stay alert. But today . . . she quickly drifts off to dreamland. In fact, a glance around the classroom would reveal many students either sleeping or gazing blankly into space.

Mr. Porter doesn't notice that his lecture is ineffective. Although he realizes that his early-morning class is quiet, he likes the fact that these students don't cause any discipline problems. It's a nice way to start his day.

Someone needs to explain to Mr. Porter that his first-period students need some stimulation to wake them up. At this time of the morning, the adolescent brain is still bathed in the sleep chemical melatonin, and some adrenaline would help overcome its effects. Talking to one another about the content of the lecture, role-playing, or creating a poster would give the students enough "good stress" to keep them involved in the class.

For second period, Amy goes to English class. She is more awake now and enjoys the class's study of *Romeo and Juliet*. The students have compared the star-crossed lovers to those in modern books and times. Viewing *West Side Story* helped them see how

cultures affect relationships. Mr. Miller, the English teacher, knows that his adolescent students respond to emotion and novelty.

As a result of the sex hormones that are flooding their limbic system—the brain's emotional center—adolescents experience intense feelings and seek out situations in which they can express their emotions (Wallis, 2004). The frontal lobe of the brain—the part that contributes the judgment, organization, and planning that constrain our emotional impulses—is the last area to mature and is not yet functioning at full capacity in most adolescent learners. Adults must act as the frontal lobe for these students (Giedd, 2002)—as Mr. Miller does when he allows them to engage emotionally with the content he teaches, but within the parameters he has established.

Physical education is Amy's next stop. She notices that her agility is improving. She is refining her skills in dancing and in most sports. Amy doesn't realize that the parietal lobe of her brain is maturing. Because this lobe affects movement and spatial awareness, most adolescents find that their skills in these areas are expanding (Feinstein, 2004).

This week, the class plays volleyball.

Amy loves to spike the ball across the net. She is pleased when she sees Gina on the opposing team. Gina is dating Amy's old boyfriend, and Amy hates her. She lets her limbic system and her intense emotions take over as she spikes the ball into Gina's face. It looks like an honest mistake. Amy apologizes, and Gina accepts—but both girls know that Amy was trying to get even. When Amy's frontal lobe becomes better developed, she will be able to control outbursts like this one.

Physical activity is very good for Amy's cerebellum, the structure in the back of the brain that coordinates movement. Recent research suggests that the cerebellum also coordinates cognitive thought processes and that the more physical exercise adolescents get, the better their brains will process information (Giedd, 2002). By encouraging physical activity and intramurals in P.E. class, Amy's school helps its students build important connections in their cerebellums. Academic classrooms should also include movement to activate and strengthen this important brain structure.

Amy now heads for her second-year Spanish class, conducted entirely in Spanish. Last year, Amy would have found it difficult to speak Spanish

during the whole class, but now it seems easier for her to memorize the vocabulary and connect words to objects.

As the adolescent brain develops, memory abilities increase in the frontal lobe. The temporal lobe located at the sides of the head above the ears is also maturing, resulting in better communication skills (Feinstein, 2004). This is an excellent time in students' development for teachers to encourage communication activities, such as debates, reader's theater, and oral presentations. Because some adolescents are further along in the communication process than others, educators also need to take time to clarify students' questions and concerns to ensure that all students understand expectations.

Finally, it's lunchtime! Amy is famished. During adolescence, the female's brain secretes chemicals to make her hungrier in an attempt to prepare the body for childbearing

(Brownlee, 1999). Wide hips are desirable for this process. But wide hips are not what Amy wants. She must fight off the urge to overindulge. Her friend Tonya, who gains weight much more easily, has an even harder struggle. Tonya sits at the cafeteria table watching others consume sandwiches and pasta, while she only lets herself munch on vegetables and salads. She is frequently hungry and finds it hard to concentrate in class.

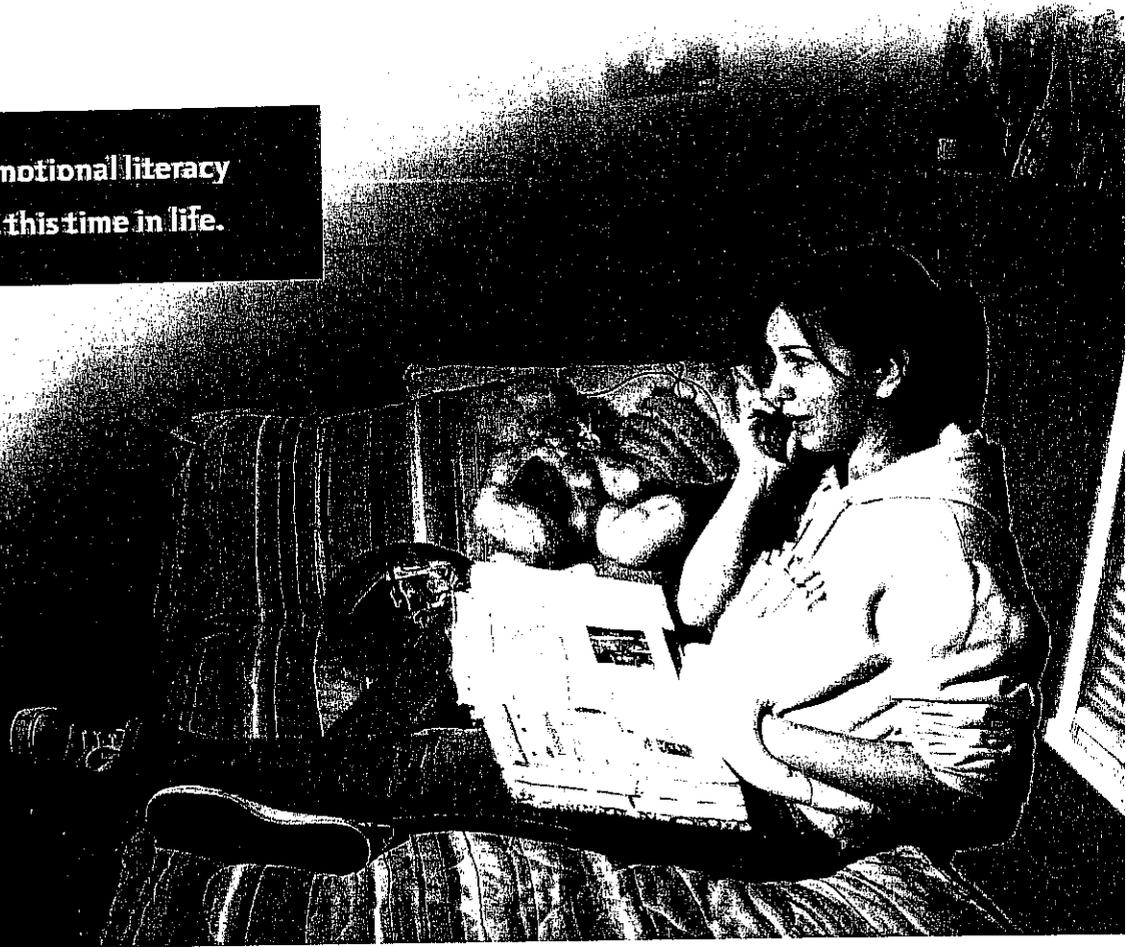
Amy and Tonya sit at the table reserved for the "fringe" group—girls who sometimes get to hang out with the most popular girls, but sometimes don't. As Amy looks over the cafeteria, she can see the cliques that compose the high school social scene (Giannetti & Sagarese, 2001). The Loners sit separated from any group, rarely making eye contact. The Friendship Circles—small groups of girls who are close friends—sit in the middle of the room. They don't seem to care that they are not

popular. Amy doesn't "get" them. The fringe group sits as close as it can to the popular group, but still not close enough.

Today Amy wants to check out the new boy, so she just grabs a bag of chips and a diet soda. So far today, she has eaten only carbohydrates. J.D. is at the other end of the cafeteria. Amy walks past him twice, hoping that he will notice her, but he seems to be entirely involved with some friends and his lunch. Amy worries that she's not pretty or popular enough to attract boys, and she heads for the restroom to comb her hair and fix her makeup.

Social skills and emotional literacy are still developing at this time in life. Putting students in mixed-sex and mixed social groups for academic networking and projects may help them find common ground. Teachers who provide adolescents with the opportunity to see the value in their own contributions as well as in the contributions

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of others will be providing a lifelong and brain-changing learning experience.

During fifth period, Amy has study hall. The carbs she has consumed are triggering the release of the chemical serotonin, which makes her feel mellow and sleepy (Goldman, Klatz, & Berger, 1999). Instead of finishing her history homework for next period, she puts her head down on her desk and drifts off. It seems like only seconds later when the bell wakes her, signaling the end of the period. Amy's heart pounds as she grabs

displays the poor decision making that is commonplace among adolescents (Wallis, 2004).

Amy's last class of the day is math, one of her least favorite subjects, and she is still tired. But Mrs. Meyers knows how to engage her students and keep them focused. Today she uses problem-based learning. She tells students to work in small groups and figure out what their annual income must be to afford the car of their dreams. Mrs. Meyers appeals to the adolescents with

ever had. Amy doesn't realize that their "coolness" reflects their understanding of how to teach adolescents. I think I'm in love with J.D. Amy's limbic system, responding to a flood of hormones, creates intense feelings of well-being, unfiltered by the more tempered judgment she might develop when she's older. Even though I'm looking forward to Tonya's sleepover this weekend, I can't wait for school tomorrow. My homework is finished; I get to find out more about Romeo, I get to work on my math project, and I get to see J.D. But Mr. Porter isn't lecturing, so I have to be awake for first period. I hope I can fall asleep soon. E

Adolescents experience intense feelings and seek out situations in which they can express their emotions.

her books. She starts to worry that other students in her history class might make fun of her for not doing her homework, and tears come into her eyes. This emotional reaction is common for Amy these days.

Amy has a stroke of luck today. Miss Reed has gone home ill, and the substitute teacher gives the students study time instead of collecting the homework. Although still groggy, Amy is determined to finish her history homework for tomorrow. But Tonya and Samantha are in her history class, and they move next to Amy.

"I'm going to have a sleepover this weekend. Who should I invite?" Tonya asks.

"I have to finish my history homework," Amy says, continuing to write.

"I think we should see if the boys can sneak over to your house after your parents are asleep!" Sam suggests.

Amy stops working, turns to her friends, and joins them in planning the weekend. If Amy's frontal lobe were more developed, she probably would have continued with her work and reminded herself that she could talk with her friends later. Instead, she

a novel assignment, allows them to work together, and gives them choices. The class quickly gets to work.

The last bell of the day surprises the busy students. Amy runs to the bus to meet Sam and Tonya. She is wide awake for the trip home. But she knows that when she gets there, she must grab a quick bite and then go back to school for another play practice. She is amazed at how easily she remembers her lines. In fact, she has memorized almost everyone's lines. It's so much easier than schoolwork!

Amy doesn't realize that the movement involved in the play helps her remember. Repeating the lines along with the movement creates another cue or trigger for the memory—much like it did in her toddler days of playing pat-a-cake and repeating the rhyme that goes with the actions (Sprenger, 1999). In addition, the play's strong story line sparks the emotional responses that help adolescents focus and learn.

Home from play practice at 9:00 p.m. again, Amy plows through her homework and then writes in her journal before she goes to bed. *Mr. Miller and Mrs. Meyers are the coolest teachers I've*

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