

25 Facts about the TEEN Brain

1. The brain **develops from the back to the front** with the Prefrontal cortex (Brain's remote control and Voice of reason) being the last to reach maturation in the mid to late 20's. **Responsible for:** Reasoning, Emotional Control, Sound judgments, Determining right from wrong, Cause and Effect relationships, Impulse Inhibition, Planning and Organization of multiple tasks, Goal and Priority setting.
2. The under-developed Prefrontal Cortex causes the brain to default to the emotional amygdala for decision making instead of higher-level thinking, creating many 'gut feeling' decisions and reactions.
3. **Myelination** increases during the teen years. The axons/synapses get a thicker coat of insulation, which makes electrical impulses travel quicker, speeding up thinking and processing.
4. **Pruning** increases greatly during the teen years. It is the brain's way of deciding which skills (neural pathways) need to be kept and which aren't being used and can be eliminated. This will help the brain operate more efficiently. It is literally a period of 'Use it or Lose it'.
5. The teen brain is moving from concrete to abstract thinking and teens will often become more cause-oriented and idealistic.
6. The **amygdala** is often called the Fear Center. Located in the Limbic system, its job is to keep us safe by interpreting all incoming sensory information. Any perceived danger, (emotional or physical) and **BOREDOM** will cause the amygdala to go into a hyperactive state and drive the body into **fight, flight or freeze**.
7. When the amygdala is in a hyperactive state called **Downshifting**, all incoming information is driven into the lower animalistic part of the brain and all learning and higher level thinking stops.

You can't read a book and run from a lion at the same time.

8. **Teens process information very differently than adults.** The limbic system & amygdala is used as opposed to an adult's prefrontal cortex. Incoming information is being interpreted and connected to an emotional response.
9. Teens will often interpret neutral/ambiguous facial expressions or tones of voice as negative or angry because they are **unable to accurately assess emotions**.
10. As **Oxytocin increases** during puberty, teens experience a **heightened level of self-consciousness**, leading them to believe that everyone is as concerned with their thoughts and behaviors as they are and that there is an audience of people always watching them.
11. Teens become very **ego-centric** and believe that their emotions are unique and that NO ONE has ever experienced similar feelings/emotions.
12. Emotional outbursts can be sudden, extremely intense and overly dramatic because of the increased electrical activity in the brain. Rage, Sadness, Aggression, Happiness can all be extreme at times.
13. There is a **greater need for sleep** during adolescence. (9.5 hours) What often is seen as 'lazy' or 'unmotivated' is due to an increase in fatigue because of the increased growth activity in the brain and body.

14. **Circadian rhythms** are set much later. The Sleep-Wake up cycle doesn't begin until 11:00-12:00 midnight making mornings much more difficult for teens.
15. Teens are great at arguing because of myelination, but not always logical in their thinking.
16. Pleasure and Risk centers of the brain develop early in adolescence and kicks into overdrive, **causing teens to pay attention to novelty, risky activities and instant gratification.**
17. **Dopamine** (known as the 'Feel Good' chemical) has an **addictive quality**. Experiences with dopamine make teens want more of that activity. Video games, great relationships, risky activities, alcohol, peer approval, falling in love, learning new tasks, positive social interactions, laughter all release dopamine.
18. Teens are more likely to say hurtful things because of a **lack of inhibition and censoring** due to the under-developed prefrontal cortex.
19. **Peers and friendships** become **much more important than family** connections and are a driving force in decisions, behaviors and attitudes.
20. **Estrogen and Testosterone** can cause **extreme volatile mood swings**. Knee jerk, dramatic, drastic reactions are often due to surges of these hormones along with the amygdala misinterpreting other's emotions and intentions.
21. Teens will often **'try on' many identities** as their desire for autonomy grows.
22. The developing teen brain can often handle more alcohol than the adult brain without outward signs of inebriation but is much more susceptible to addiction if drinking starts early because of the pruning process taking place.
23. The lack of impulse control diminishes the ability to fully embrace **delayed gratification**.
24. Cells that **'Fire Together-Wire Together'** and the teen brain is especially in need of continued strengthening of neural pathways when learning new skills or concepts or the brain will prune them. (U Repetition with various learning methods will drive information into long term memory storage.
25. The **Reticular Activating System** is the gate-keeper for all stimulus that we are bombarded with 24/7. It decides what you will consciously pay attention to and what stimulus will not register and be filtered out. The RAS pays attention to stimulus in 3 categories:
 - 1) **Physical Needs**-If you are engrossed in reading a book and get cold, your RAS will interrupt your reading so that the thought of being cold will surface to the conscious mind. Or if a student is hungry or sexually aroused, that stimulus/thought will trump all incoming stimulus including an amazing lesson you are passionate about teaching.
 - 2) **Self made choices**-Anything the brain deems important it will pay attention to; for teens, that means their friends, their phone, personal interests/hobbies, sex, another student they find attractive, risks, planning for the weekend, etc
 - 3) **Novelty**-Because of the developed pleasure center in the teen brain, anything that is new, different, unexpected, out of the norm will cause the RAS to pay attention to that stimulus. Something as simple as changing the arrangement of your classroom, tone of voice change, music, a poem, an unexpected picture or item introduced into a lesson, putting on a hat, random pause, humor will all alert the RAS that something new is happening so the brain will pay attention.



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