**ON THESE PAGES, please provide notation that shows evidence of your thinking, questioning and connecting WHILE you read (text-to-text, text-to-self, and text-to-world), along with your best attempts at figuring out unknown words in context. Then, complete the Food for Thought section at the end.**

**A Neuroscientist’s Survival Guide to the Teenage Brain**

<http://www.theglobeandmail.com/life/parenting/a-neuroscientists-survival-guide-to-the-teenage-brain/article22363180/>

In her new book The Teenage Brain: A Neuroscientist’s Survival Guide to Raising Adolescents and Young Adults, Dr. Frances Jensen explains the science and offers a guide to navigating the perilous territory of a teenage brain.

**ON BRAIN DEVELOPMENT**

The connectivity of the brain slowly moves from the back of the brain to the front. The very last places to “connect” are the frontal lobes. In fact, the teen brain is only about 80 per cent of the way to maturity. That 20 per cent gap, where the wiring is thinnest, is crucial and goes a long way toward explaining why teenagers behave in such puzzling ways – their mood swings, irritability, impulsiveness and explosiveness; their inability to focus, to follow through, and to connect with adults; and their temptations to use drugs and alcohol and to engage in other risky behaviour.

**ON MANAGING RISK**

You have to be proactive. You have to stuff their minds with real stories, real consequences, and then you have to do it again – over dinner, after soccer practice, before music lessons, and, yes, even when they complain they’ve heard it all before. You have to remind them: These [tragic] things can happen any time, and there are many different situations that can get them into trouble and that can end badly.

**ON MEMORY**

One of the reasons that repetition is important lies in your teenager’s brain development. One of the frontal lobes’ executive functions includes something called prospective memory, which is the ability to hold in your mind the intention to perform a certain action at a future time – for instance, remembering to return a phone call when you get home from work. Researchers have found not only that prospective memory is very much associated with the frontal lobes but also that it continues to develop and become more efficient specifically between the ages of 6 and 10, and then again in the 20s. Between the ages of 10 and 14, however, studies reveal no significant improvement. It’s as if that part of the brain – the ability to remember to do something – is simply not keeping up with the rest of a teenager’s growth and development.

**ON MULTITASKING**

Even though their brains are learning at peak efficiency, much else is inefficient, including attention, self-discipline, task completion and emotions. So the mantra “one thing at a time” is useful to repeat to yourself. Try not to overwhelm your teenagers with instructions. Remember, although they look as though they can multitask, in truth they’re not very good at it. Even just encouraging them to stop and think about what they need to do and when they need to do it will help increase blood flow to the areas of the brain involved in multitasking and slowly strengthen them. This goes for giving instructions and directions, too. Write them down for your teens in addition to giving them orally, and limit the instructions to one or two points, not three, four or five.… Perhaps most important of all, set limits – with everything. This is what their overexuberant brains can’t do for themselves. So be clear about the amount of time you will allow your teenager to socialize “virtually,” either on the Internet or through texting.

**ON SLEEP AND STUDYING**

In experiments done on high-school students at Harvard Medical School and Trent University in Canada, it was discovered that consolidation of memories happens in two stages during sleep: slow-wave sleep and rapid eye movement (REM) sleep. Early in the sleep cycle of the teenager, the brain enters a slow-wave stage, which is the deepest sleep state. As a child goes through puberty, this deep slow-wave sleep decreases by as much as 40 per cent. During REM sleep, which happens later in the sleep cycle, the brain puts on a kind of show, re-enacting through dreams the information learned and further solidifying the information for storage in the brain’s memory areas. This is why it is so important for teens to get more than just a good night’s sleep before an exam. They need to get that good night’s sleep right after studying for the exam.… When I’ve given talks to teenagers and I tell them about what an exciting time this is for their brains and how easy it is for them to learn new things – especially if they sleep on that knowledge – there are always a few smart alecks who say, “Cool, that means I don’t have to start studying until right before I go to bed.” I have to tell them, “No, just before you go to bed shouldn’t be the first time you see the information. Your brain isn’t that responsive. This is just a good time to review.”

**ON RISK, REWARDS AND CONSEQUENCES**

The chief predictor of adolescent behaviour, studies show, is not the perception of the risk, but the anticipation of the reward despite the risk. In other words, gratification is at the heart of an adolescent’s impulsivity, and adolescents who engage in risky behaviour and who have never, or rarely, experienced negative consequences are more likely to keep repeating that reckless behaviour in search of further gratification. This reward-seeking impulse is located deep in the brain in two areas, the nucleus accumbens and the ventral tegmental area (VTA). These structures belong to the brain’s pleasure centre because they are responsible for releasing dopamine when a person contemplates or anticipates a reward (eating food, obtaining money, taking drugs, etc.). In effect, the nucleus accumbens both alerts us to the possibility of pleasure and motivates us when we are in a position to experience that pleasure. It turns out that this area is much more susceptible to the powers of addiction in the adolescent brain compared with the adult brain.… While the nucleus accumbens and the VTA house reward circuits, their activity is also controlled by the frontal lobes. In the adult, fully myelinated brain, the responsivity of these areas can be muted by the frontal lobes in the form of impulse control.

**ON MENTAL HEALTH**

The vulnerability of a teen to emotional and psychiatric issues cannot be overemphasized. The teenage years are a developmental stage whose byproducts are a hypersensitivity to stress, an inability to exercise self-analysis or insight, and membership in a peer group equally unable to interpret warning signs or to offer adequate empathy. Here is a major opportunity for the adults around teenagers: Be vigilant, exercise your own well-developed skill sets to ask questions, probe, stay connected and, most important, have a low threshold to seek medical advice or counselling for symptoms that appear to change from the ordinary.

**ON HOMEWORK AND THE DIGITAL INVASION**

When asked about multitasking, most teens say they believe they are good at it and that it allows them to accomplish more. On the other hand, studies show that multitasking actually interferes with learning in adolescents and that it takes anywhere between 25 per cent and 400 per cent longer for a teenager to complete his or her homework if multitasking is involved. So why do teens profess that multitasking helps them? It may be because multitasking makes them feel emotionally satisfied.… “This is worrisome,” Dr. [Zheng] Wang of Ohio State told the media, “because students begin to feel like they need to have the TV on or they need to continually check their text massages or computer while they do their homework. It’s not helping them, but they get an emotional reward that keeps them doing it.”

Adapted from The Teenage Brain: A Neuroscientist’s Survival Guide to Raising Adolescents and Young Adults by Frances E. Jensen, M.D., with Amy Ellis Nutt. Copyright © 2014. Reprinted by permission of HarperCollins Publishers.

**FOOD FOR THOUGHT:**

How about considering TWO aspects of this article:

1. What is the most important thing it taught **you** about your brain? If you already knew all of this information, then what did it substantiate (support) for you?
2. What insight or information did it provide that is important for **someone else** to understand about your brain? Be specific. Consider a parent, teacher, friend, employer, or whoever. What’s important for them to know about YOUR brain, and why is that fact important?