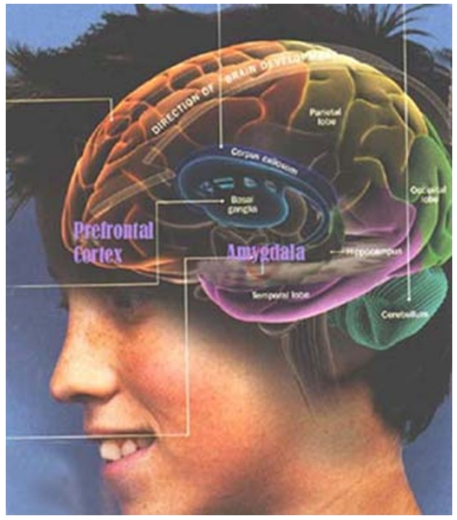
The brain performs many functions at once and is a complex organ.

Neuro science has helped us understand the roles different parts of the brain play.

An article in the May 10, 2004 issue of TIME, "What Makes Teens Tick", provides excellent information including the pictures in this pamphlet for further information.



Prefontal Cortex

The CEO of the brain and the last part to mature. Usually around the early 20's. Located just behind the forehead , the prefrontal cortex grows during the pre teen years and then shrinks as neural connections are pruned during adolescent years.

Amygdala

This is the emotional centre of the brain and home to such primal feelings as fear and rage**. In processing emotional information adolescents tend to rely more heavily on the amygdala.** Adults depend more on the rational prefrontal cortex which is still under developed in adolescence. This may explain why teenagers react more impulsively than adults.

Cerebellum

Long thought to play a role in physical coordination. This area may also regulate certain thought processes. It is more sensitive to the environment than heredity and supports activities of higher learning such as mathematics, music and advanced social skills. New research shows it changes dramatically during adolescence, increasing both the number of neurons and the complexity between them.

Corpus Callosum

Thought to be involved in problem solving, this bundle of nerve fibres connects the left and right hemispheres of the brain. During adolescence, the fibres thicken and process information more efficiently.

From age 10 years on, as our students enter intermediate school , circuits in the brain that: coordinate our children's behaviours, help them make good decisions, control their impulses, react appropriately in different situations, govern their eating and sleeping habits, etc., are remodelled , laying the groundwork for adult life.

Much of this remodelling is influenced by each individual's interactions with the outside world; the adolescent brain is more highly mouldable by experience than the adult brain.

During their time at intermediate and at secondary school, a weeding out process begins in the students' brains. Frontal lobe circuits that are exercised are strengthened while other connections are weeded out – leading to a reduction in gray matter volumes in the frontal lobes throughout the adolescent period.

This is a "use it or lose it" period of personal change.

It can be helpful to think of gray matter in the frontal lobes of a newborn as a lump of clay. The lump of clay continues to grow during childhood and is then sculpted and shaped during adolescence into the structure that will exist during adulthood.

Our intermediate school is structured to optimise the experiences each student has in recognition of the need to expose emerging adolescents to a wide variety of activities and experiences as they rewire their brains for adulthood.

Adolescence is a tumultuous time for everyone involved. Somehow, the individual must make the transition from dependence to independence.

The changes in their brain naturally help drive adolescents away from the nest. Adolescents push away from parents and others who represent authority, including teachers. They are built this way. They are also built to take risks and seek out novel experiences, which helps them build confidence and acquire the skills needed to make a living in the world.

Emerging adolescence is the time to actually increase your parental involvement through guidance and knowing what they are doing.

*•It's the beginning of the 2nd most rapid & **INFLUENTIAL** period of development after ages 0-3*.

Adolescents behave differently from adults because their brains are different.

Adolescence is a period of rapid brain development.

The brain is most vulnerable when it is undergoing very rapid periods of development.

The adolescent brain is highly susceptible to damage and it is also highly receptive to new experiences and learning.

Adolescents are really poised to process information in a very new way.

Adolescents are more risk prone and less risk averse.

Adolescent's brains are reward driven because their dopamine system is rapidly developing.

Adolescent brains are also very responsive to certain classes of drugs, including alcohol which can lead to addiction and over consumption.

In addition to changes in risk taking behaviour, changes in the adolescent brain also influence their sleeping and waking cycle. Their circadian rhythms change, and their preferred bedtime and waking times get later and later.

Sleep recharges the brain and allows the body to rest and heal. While we sleep our brain consolidates memories. Inadequate sleep affects brain cell function. Adolescents should ideally have 8 to 9 hours sleep on a regular basis.

Understanding the immaturity of the adolescent brain helps make us more compassionate with adolescents and understand their behaviour. We are less likely to expect them to behave like adults.

As emerging adolescents our students are entering this hugely important phase in their lives.

What's going on in my child's head?

Understanding our emerging adolescent child.

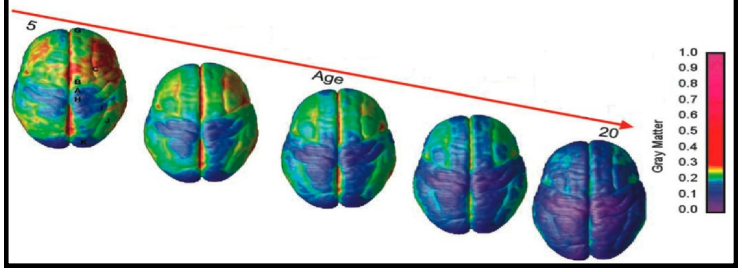
A Parent Guide

Teenagers' selfish, reckless, irrational and irritable behaviour can be explained by the huge amount of construction going on inside the adolescent brain. In the teenage years, our brains may be fully grown, but the wiring is certainly still a work in progress.

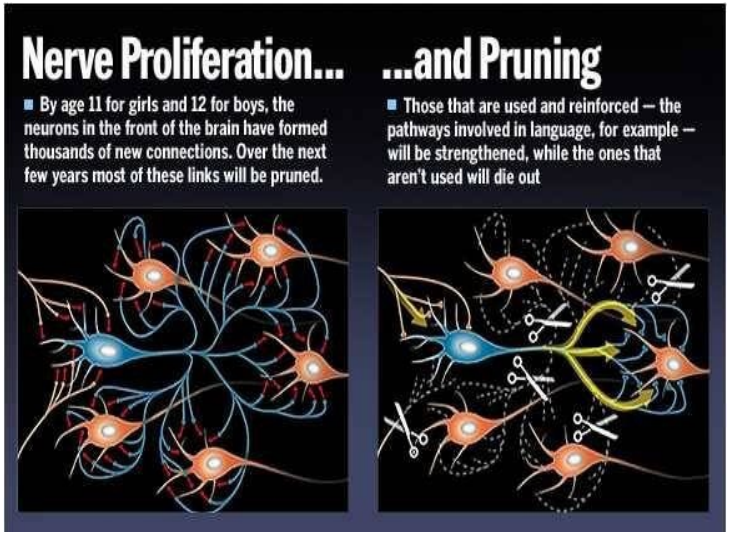
Psychologists used to explain the particularly unpleasant characteristics of adolescence as products of raging sex hormones, since children's brains reach near adult cerebral volumes well before puberty.

More recently, though, imaging studies have revealed a huge amount of structural changes in the teens and early 20s that go a long way towards explaining these tumultuous teenage years. Your child is entering a period where a massive production of brain cells and neural connections occurs.

PRUNING THE TEEN BRAIN
Adolescence is a time of pruning. Gray matter is at its peak in childhood and then reduces in volume during adolescence as unnecessary or redundant pathways are eliminated. Gray matter contains nerve cells and their librous pathways without any myelin—a fatty sheath that acts as insulation to nerve fibers. This series of magnetic resonance images shows how gray matter declines in adolescence through pruning and as myelin covers nerves. Myelinated neurons are white matter and transmit signals more efficiently.



Pictures from TIME MAGAZINE May 10, 2004



In adolescents two processes are taking place at a rapid rate: ***pruning***, the process by which unnecessary nerve synapses (gray matter) in the frontal lobe are eliminated) as well as ***myelination***, involving white matter that envelops connections to stabilize them. This conversion of gray to white matter is critical to making the brain's operation more efficient and developing the neural networks regulating behavior. The frontal lobes regulate the amygdala, the brain's emotional center, which controls anger, fear, recklessness, and gut responses.
A fully developed prefrontal cortex helps adults predict the consequences of their actions. In adolescents, the less developed prefrontal cortex affects the adolescent's ability for mental reasoning, decision-making, and assessment of consequences.

Emerging Adolescents

Ōtūmoetai INTERMEDIATE SCHOOL

HOPE . STRIVE . ACHIEVE

Kia oke ngā tahi tā tou, ka ekea te taumata o angitu

When we strive as one, we ascend the pinnacle of success