

# In The News

## The Teen Brain: It's Just Not Grown Up Yet

When adolescence hit Frances Jensen's sons, she often found herself wondering, like all parents of teenagers, "What were you thinking?"

"It's a resounding mantra of parents and teachers," says Jensen, who's a pediatric neurologist at Children's Hospital in Boston.

Like when son number one, Andrew, turned 16, dyed his hair black with red stripes and went off to school wearing studded leather and platform shoes. And his grades went south.

"I watched my child morph into another being, and yet I knew deep down inside it was the same Andrew," Jensen says. Suddenly her own children seemed like an alien species.

Jensen is a Harvard expert on epilepsy, not adolescent brain development. As she coped with her boys' sour moods and their exasperating assumption that somebody else will pick up their dirty clothes, she decided to investigate what neuroscientists are discovering about teenagers' brains that makes them behave that way.

### Teenage Brains Are Different

She learned that that it's not so much *what* teens are thinking — it's *how*.

Jensen says scientists used to think human brain development was pretty complete by age 10. Or as she puts it, that "a teenage brain is just an adult brain with fewer miles on it."

But it's not. To begin with, she says, a crucial part of the brain — the frontal lobes — are not fully connected. Really.

"It's the part of the brain that says: 'Is this a good idea? What is the consequence of this action?'" Jensen says. "It's not that they don't have a frontal lobe. And they can use it. But they're going to access it more slowly."

That's because the nerve cells that connect teenagers' frontal lobes with the rest of their brains are sluggish. Teenagers don't have as much of the fatty coating called myelin, or "white matter," that adults have in this area.

Think of it as insulation on an electrical wire. Nerves need myelin for nerve signals to flow freely. Spotty or thin myelin leads to inefficient communication between one part of the brain and another.

### A Partially Connected Frontal Lobe

Jensen thinks this explains what was going on inside the brain of her younger son, Will, when he turned 16. Like Andrew, he'd been a good student, a straight arrow, with good grades and high SAT scores. But one morning on the way to school, he turned left in front of an oncoming vehicle. He and the other driver were OK, but there was serious damage to the car.

"It was, uh, totaled," Will says. "Down and out. And it was about 10 minutes before morning assembly. So most of the school passed by my wrecked car with me standing next to it."

"And lo and behold," his mother adds, "who was the other driver? It was a 21-year-old — also probably not with a completely connected frontal lobe." Recent studies show that neural insulation isn't complete until the mid-20s.

This also may explain why teenagers often seem so maddeningly self-centered. "You think of them as these surly, rude, selfish people," Jensen says. "Well, actually, that's the developmental stage they're at. They aren't yet at that place where they're thinking about — or capable, necessarily, of thinking about the effects of their behavior on other people. That requires insight."

And insight requires — that's right — a fully connected frontal lobe.

### Teen Brains Are Not Fully Connected

The brain's "white matter" enables nerve signals to flow freely between different parts of the brain. In teenagers, the part that governs judgment is the last to be fully connected.

### More Vulnerable To Addiction

But that's not the only big difference in teenagers' brains. Nature made the brains of children and adolescents excitable. Their brain chemistry is tuned to be responsive to everything in their environment. After all, that's what makes kids learn so easily.

But this can work in ways that are not so good. Take alcohol, for example. Or nicotine, cannabis, cocaine, ecstasy ...

"Addiction has been shown to be essentially a form of 'learning,'" Jensen says. After all, if the brain is wired to form new connections in response to the environment, and potent psychoactive drugs suddenly enter that environment, those substances are "tapping into a much more robust habit-forming ability that adolescents have, compared to adults."

So studies have shown that a teenager who smokes pot will still show cognitive deficits days later. An adult who smokes the same dose will return to cognitive baseline much faster.

This bit of knowledge came in handy in Jensen's own household.

"Most parents, they'll say, 'Don't drink, don't do drugs,'" says Will, son number two. "And I'm the type of kid who'd say 'why?'"

When Will asked why, his mom could give him chapter and verse on drugs and teen brains. So they would know, she says, "that if I smoke pot tonight and I have an exam in two days' time, I'm going to do worse. It's a fact."

There were other advantages to having a neuroscientist mom, Will says. Like when he was tempted to pull an all-nighter.

"She would say, 'read it tonight and then go to sleep,'" he says. "And what she explained to me is that it will take [what you've been reading] from your short-term memory and while you sleep you will consolidate it. And actually you will know it better in the morning than right before you went to sleep." It worked every time, he says.

It also worked for Andrew, the former Goth. He's now a senior at Wesleyan University, majoring in physics.

"I think she's great! I would not be where I am without her in my life!" Andrew says of his mom.

For any parent who has survived teenagers, there are no sweeter words.

### Dates to Remember

**March 29 (Monday)**  
Spring Breaks Begins  
School Closed

**April 5 (Monday)**  
School Resumes

KINDERGARTEN

**The kindergarten children burst through the door each morning eager to check on the plants they are growing.** Each child has planted lima beans in a clear cup. The playground provided small stones to put at the bottom of the cups for drainage and then the process of planting began. They spooned soil into the cups and carefully placed their beans close to the side of the cup so they would be easily observed. The children know that "observation" and "recording" are important science skills. Each child put together a "Plant Journal" in which to record the observations.

**The first entry in the Journal was labeled "Day 1".** It was a description and picture of the process they used to plant the seeds. On "Day 2" they were surprised to see that their plants did not change. Changes began to occur and journal entries report "I see a root" and "I see a sprout". The children will be measuring the growth of the plants and record the number of inches daily.

**We have planted a classroom "farm".** After soaking pellets of soil and fertilizer, the children put the damp soil into a special container with a clear front for observation. The children planted radish seeds, green onion seeds and carrot seeds. A class journal is being kept and the children are taking turns making and recording daily observations. They find it very interesting to see the difference in progress as the three types of plants grow.

**Kindergarten students are also carefully watching a carrot top, an avocado seed and a sweet potato, all of which are growing without soil.** They are amazed as the roots form and the tops grow.

**A number of experiments are scheduled.** Students will prove that a plant stem brings water into the leaves, they will prove that a

plant needs light and that a plant cannot withstand cold. For each experiment the children will follow the scientific method. They will state the problem, make a hypothesis, list materials and procedures and record their observations. They will draw conclusions at the end of each experiment.



FIRST and SECOND GRADE



In Language Arts we will begin to read Emma's Journal, the story of a colonial girl who spied for the American rebels during the revolution. It goes hand in hand with our next unit of study in Social Studies.

"Life in the Southern Colonies" will include Virginia, Maryland, South Carolina and Georgia. This unit will highlight the people and their struggle to build a new life in the New World after the explorers built their settlements. Our students will continue the timeline into the colonial times and understand how individuals, events and ideas have influenced the history of various communities and the common characteristics of communities past and present.

While we continue to problem solve and use our critical thinking skills as a group, when it comes to operations we are all over the place! While some will be learning place value, others are learning to add and subtract 2 digit numbers with regrouping and still others are beginning to understand the concept of multiplication. As always, we learn at our own pace and level.

You can't take the explorer out of our students, so let's join them in a "Journey to the Center of the Earth." In Science the 1-2 class will EXPLORE the earth's crust, mantle and core; study rocks, minerals, crystals, volcanoes, mountains and the very relevant problem of erupting earthquakes. Our students will gain understanding of the causes and effects of our ever changing world.



## THIRD and FOURTH GRADE



### Language Arts

Students will add to their studies, a unit on philosophy. This is a natural unit to follow Greek Mythology. Philosophy, among other things, is self-conscious inquiry into the meaning of puzzling and contestable concepts. In ancient times philosophy was known as a search for wisdom or meaning, and many of the concepts philosophers have thought about for thousands of years are ones we use to structure our daily experience. "What is justice?" "What is beauty?" "How can I be sure of what I know?" "What is the right thing to do?" "What is real?"

Philosophy is one of the most ancient and prestigious of the disciplines, and until recently it was thought to be too difficult and uninteresting for children. Yet, consider how many perennial philosophical issues are typically encountered by children as young as four or five:

- I wonder if ghosts are real or unreal.
- When Dad tells me to be good, what does he mean?
- What makes someone a best friend?
- That's not fair!
- Why is time so slow sometimes?
- I think my doll is a person, not just a thing.
- My parents say I should tell the truth. What is truth?
- Where did grandpa go when he died?

Students will read aloud or act out a philosophical story-typically, one that depicts fictional children discovering and exploring philosophical issues and applying their reasoning to life situations.

### Social Studies

Students are thoroughly enjoying their study of the Middle Ages and are currently preparing for an imaginary field trip to a medieval town situated near a castle. They are paying attention to fine anachronistic details concerning clothing, accessories, and vocabulary that would give us away as time traveling tourists as they plan our actions on this week long imaginary field trip. Students are taking this exercise very seriously and are imagining themselves as the main characters in a covert medieval adventure as they use their knowledge of the time period to blend in seamlessly with medieval society.

Students will continue their study of the Middle Ages by learning about the role of religion in medieval times, as well as medieval medicine when they are introduced to the role of Black Plague as a bridge to the Renaissance.

### Math

**Third and Fourth Grade** have done an excellent job applying their Metric measurement skills to our Earth science unit. The **Third Graders** are moving on to 2 and 3 digit multiplication. The students are all very excited about moving on to "harder" math. **Fourth Grade** is currently reviewing decimals and will begin to work on multiplying and dividing decimals and converting decimals to fractions and vice versa. They are also continuing with developing problem solving skills. They are currently working on eliminating possibilities to make problems easier and breaking larger problems into smaller ones that they can solve. The class loves problem solving where they have to act out the problem to solve it.

### Science

**Third and Fourth Grade** are in the middle of our unit on Earth Science. With the recent Earthquakes in Haiti and Chile the students have been very interested in learning about Earthquakes and what causes them. They studied the major tectonic plates throughout the world and how the plates move. The students also studied the two scales for measuring Earthquakes the Mercalli Scale and the more Scientific Richter Scale. They noted the similarities and differences in the two scales and then created their own scale for the simulated Earthquakes we had in the classrooms. The students liked the measurement aspect of the Richter Scale and the descriptions provided by Mercalli so they merged the two scales. Our classroom scale measured the movement in millimeters and centimeters and then the class added their own description of what it would look like and feel like. The students made shake tables to create Earthquakes with and we decided to use the Erector sets the students had built for our experiments. The students were surprised how quickly the Erector sets fell apart after they had spent such a long time building them. We compared that to the time it takes to build the buildings and infrastructure in a city and how quickly they can be destroyed in an Earthquake. The students are now going to move on to Volcanoes. We will be looking for comparisons about what areas are earthquake prone and where the majority of the worlds volcanoes are located and the different types of volcanoes. We will also be looking at the igneous rocks formed by Volcanoes and study how the way the magma cools effects the properties of the rocks.



## FIFTH and SIXTH GRADE



### Language Arts

We've just finished our exams and are ready for a new grading period and a new unit. We'll be learning how to write evaluations. Students will be writing movie, game and even restaurant reviews, and learning about criteria, comparison and fairness.

In reading we'll be tackling two new genres, mystery and adventure. One group will be reading *The Westing Game*, a tale of 16 people who gather for the reading of a will, only to find that the deceased wants them to play a little game first. The other group will be reading *Hatchet*, about a boy who crash lands in the Canadian wilderness with little to survive on except the hatchet he received as a gift.

### Social Studies

We'll be finishing up our anthropological case studies with a look at two very different cultures and how they faced the pressures of colonization. We'll be studying the Maori of New Zealand who fiercely resisted early attempts at colonization. We'll then study the Saami reindeer herders of Scandinavia and see how they have adapted to life in the modern world.

### Math

**Fifth and Sixth Grade** are starting the third term with the study of Geometry. They will be working on classifying lines, angles, and polygons. They will also be studying how plane figures can be transformed through translations, rotations, and reflections. The class will be studying the art of M.C. Echer and tessellations and begin exploring the Golden Ratio. After the class has a solid foundation on plane and solid figures we will move on to studying perimeter, area, and volume. The students will learn how to find the area of parallelograms, triangles, and irregular figures. We will also study the properties of circles and pi.

### Law

Students have begun to study the basics of how our Constitution works. They will learn the ways in which the Framers organized our national government. Students will analyze the basic ideas in the Preamble to the Constitution. Most important, they will learn that one of the Framers' major concerns was to create a strong national government, while at the same time, limiting the powers of that government to protect the rights of the people. To accomplish this task, the Framers separated the powers of the national government into three branches. Finally they will learn how each branch can check the powers of the other so that no one branch can totally dominate the government.

### Science

Very few advances in science follow a linear path: there are usually a plethora of ancillary scientists whose contributions to the scientific climate of the time provide the essential elements for discovery. Then there are the scientists whose insights are crucial to the final momentous breakthrough. Abstract ideas are easier to grasp when coupled with real people and tangible results. Students will be exploring the multitude of ideas generated by the great scientists of our written record, as well as a few under-credited individuals denied their 15 minutes of fame due to factors beyond their control. Extraordinary discoveries require extraordinary minds, and extraordinary experimental design. By exploring these minds and designs, we hope to help curious students understand the core concepts that helped shape our scientific world.

**Grades Five-Six** will be wrapping up this physics unit with demonstrations of density and non-Newtonian fluids. They will then explore the ideas and discoveries of a variety of scientists. In early April, we will begin construction of our solar cars, boats, ovens, and any other solar device to be used on Solar Day.



## SEVENTH and EIGHTH GRADE



*Chief Justice Charles T. Wells*

### Language Arts

We're just finishing up *All Quiet on the Western Front*. Students can't help but have a very different view of war after reading this book. We'll then be looking at the aftermath and how the seeds were sown for the start of World War II.

In debate, we're focusing on free-form and impromptu argumentation, but will soon return to our formal team debates.

### Social Studies

How did the Civil Rights movement find its genesis in the Civil War? We'll be studying the tensions as they built up in the years before the war--The Missouri Compromise, the Dred Scott decision, the Fugitive Slave Act—all the precursors to the most horrific conflict this nation has ever seen. We'll be paying particular attention to how a war to preserve the union evolved into a war to free the slaves.

### Law

Students in the Grade 7-8 were enthralled to speak with former Chief Justice Charles T. Wells. Justice Wells was guest speaker in the law class and shared his experiences as a lawyer and judge. Students asked pointed questions about law and the conflict between law and personal beliefs.

Justice Wells was Chief Justice during the famous Terry Schiavo case and the Bush v. Gore election recount.

Justice Wells was on the state's top court from 1994 to 2009. He served the Court as Chief Justice from July 1, 2000 through June 30, 2002. He is now a lawyer with the firm of Gray-Robinson.

### Math

Both in Algebra and Pre-Algebra students are learning how to solve multi-step equations and how to graph them on a coordinate plane. They will begin graphing linear equations, learn how to find the slope and intercepts of the lines and how to graph inequalities. Algebra will add solving linear systems through graphing, addition, and subtraction. After we finish with graphing Pre-Algebra will move on to ratios and proportions and Algebra will begin working with radicals and radicals in equations.

### Science

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**Grades Seven-Eight** will continue with the electromagnetic spectrum and will be filming their own experimental design for how many licks it takes to get to the center of a Tootsie Pop. In early April, we will begin construction of our solar cars, boats, ovens, and any other solar device to be used on Solar Day.



## COMPUTERS

**Kindergarten** is working on animating their self portraits. They will be working on various graphics and audio programs. They will also continue to practice their typing skills.

**Grades One-Two** have completed their digital story about the explorers and have presented it to their parents on Explorers' Day. It was an impressive project and the boys and girls can be very proud of their efforts. The students will be bringing home a copy of their story and video clips from Explorers' Day. If you have any clips that you would like me to include, forward them to me ASAP (preferably in a quicktime file). Our next lesson will include creating a video short to highlight a social issue.

**Grades Three-Four** continue to hone their typing skills.

**Grades Five-Six** will be creating a video on a science topic using various graphics and audio programs.

**Grades Seven-Eight** continue to work on research, word processing, spreadsheet, and graphics programs.



## NOTICIAS EN ESPAÑOL (SPANISH NEWSLETTER)

**Kindergarten**

Animals, Animals and more Animals! This time we are going to learn about sea animals, such as *el delfín*(the dolphin), *la ballena*(the whale), *el tiburón*(the shark) and much more. The children will write a book containing short sentences using sea animal words they have learned: *El tiburón es muy grande*.

**First and Second Grades**

The children will learn the vocabulary related with rooms at home, such as *el comedor*(dinning room), *la sala*(living room), *la cocina*(the kitchen) etc. They will use new words in sentences with the verb to be (*está, es*) and there is/are (*hay*): *La cocina es muy pequeña*. We will continue working with the mini-books related with this topic.

**Third and Fourth Grades**

The students are working on a story called “*El cuento del gato*” using TPR approach that allows the students to understand the story immediately. We will continue working on these kinds of stories they really love them. Besides the stories, the students will learn about the occupations or professions, such as *abogado*(lawyer), *doctor*(doctor), *enfermera*(nurse), etc. Then, they will write stories about their families and occupations.

**Fifth and Sixth Grades**

The students continue describing what they like and don't like to eat and drink. They will learn about all kind of meals, compare and contrast eating customs in Spanish-speaking countries and in the United States. “*La historia del chocolate*” is the reading that we are going to read and they will rely on the cognates to understand the context.

**Seventh Grade**

The students continue to work on home activities and will be able to tell where they live, describe their home, and name household chores. They will learn more stem-changing verbs (*e→ie*) like *preferir*(to prefer). The student will compare and contrast the use of outdoor space in Spanish and the United States.

**Eighth Grade**

The students are working on the vocabulary used in Mexican restaurants and will be able to ask politely to have something brought to them, order a meal, and say what they ate and drank. They will learn the preterite tense of verbs ending in *-er* and *-ir* to tell what happened in the past. We'll also work on the reading “*Chilemania*”, a description of the chile ingredients in the Mexican food.