EXPEDITIONARY LEARNING

Grade 7: Module 4A: Unit 1: Lesson 1

Introducing Module 4A: This Is Your Brain—Plugged In

Long-Term Targets Addressed (Based on NYSP12 ELA CCLS)	
I can cite several pieces of text-based evidence to support an analysis of informational text. (RI.7.1) I can determine a theme or the central ideas of informational text. (RI.7.2) I can analyze the organization of an informational text (including how the major sections contribute to the whole and to the development of the ideas). (RI.7.5) I can analyze the main ideas and supporting details presented in different media and formats. (SL.7.2)	
Supporting Learning Targets	**Ongoing Assessment**
• I can analyze photos, videos, and quotes to find a main idea. • I can determine important ideas in the article "Teens and Decision Making." • I can analyze the basic structure of an informational text.	• Notices and Wonders note-catcher

Agenda	Teaching Notes
1. Opening A. Entry Task (8 minutes) B. Reviewing Learning Targets (2 minutes) 2. Work Time A. Gallery Walk (10 minutes) B. "Teens and Decision Making" (20 minutes) 3. Closing and Assessment A. Introducing the Neurologist's Notebook (5 minutes) 4. Homework A. Read "The Teen Brain—It's Just Not Grown Up Yet" and use the questions that are to the right of the text to help you synthesize your learning. Fill out neurologist's notebook #1.	• This lesson introduces students to Module 4A: This Is Your Brain—Plugged In. Students consider a short video and then participate in a modified Gallery Walk to preview and connect the learning that will follow in future lessons. • The Gallery Walk protocol has been modified, since its purpose here is to pique interest and curiosity, not to share text-based information. Students carefully and silently study the display of video and images, and then record observations and questions to help build background knowledge, foster community, and spark curiosity. Building background knowledge in this way promotes equity, since it "levels the playing field" for students—no matter what level of knowledge students have about the topic when they walk in, all get to learn before sharing with peers. Some of the Gallery Walk items are suggestions; se your judgment about which items to post. • The success of this lesson depends on building suspense and piquing students' interest. Therefore, do not give away too much information about the module, its texts, or its themes until the class has completed the Gallery Walk. • Students will revisit the Gallery Walk in Lesson 7, as they think back on what they have learned in Unit 1 and what questions they still have that will inform their research in Unit 2. In Lesson 7, students will again use their Notices and Wonders note-catcher from this lesson; be sure they have a place to keep the completed note-catcher until then, or consider keeping the note-catchers for the class and returning them during Lesson 7. • This lesson ends with a read-aloud of one of the building background knowledge texts for this module. Students will return to this text in Lessons 2 and 3. Today they will focus on noticing the structure specifically. This will help them use the structure of the informational texts they read later in the unit to help them determine meaning (RI.7.5). • Throughout the unit, students will use a variety of strategies, both in class and as homework, to process new vocabulary, including a Domain-Specific Vocabulary anchor chart, which is introduced here in Lesson 1.

Agenda	Teaching Notes (continued)
	• For homework, the students will read a text and complete their first entry in their neurologist's notebook, which they will come back to throughout the unit. The neurologist's notebook, which captures main ideas and supporting details, focuses on RI.7.2 and helps to scaffold toward the necessary skills for SL.7.2. Because this is the fourth module of the year and the fourth time students have completed readers' notes of this kind, students should be able to grapple with these notes on their own. In Lesson 3 you will have a chance to address any misunderstandings. • In the neurologist's notebook the terms "supporting idea" and "supporting detail" are used interchangeably. This is intentional. Although "detail" is the more common term, in many of the texts they read, students must synthesize many facts together to articulate the supporting idea. The word "idea" is there to signal that it should be a summation of evidence and not just one fact. • Collecting the neurologist's notebook each day will allow for ongoing formative assessment. Answers for teacher reference will accompany each neurologist's notebook entry in this unit. Look for this document in the supporting materials immediately following the neurologist's notebook. • This lesson focuses on SL.7.2 and RI.7.2: students interact with different media and texts to find main ideas, supporting ideas, and details. SL.7.2 is a new standard and will be emphasized throughout Unit 1. • In advance: – Read the building background knowledge texts that will be used throughout Unit 1 (see Unit 1 Overview). – Prepare the Gallery Walk: • Most items are for display around the room (on chart paper or taped to the wall)—some items are images and others are quotes. • Post or place the items in a way that will allow students to move freely and comfortably from one item to the next. • Item 1 is a short video, which students will watch together as a class. In Lesson 7, you will display it on a computer.

Agenda	Teaching Notes (continued)
	• Please bear in mind that Youtube, social media video sites, and other website links may incorporate inappropriate content via comment banks and ads. While some lessons include these links as the most efficient means to view content in preparation for the lesson, be sure to preview links, and/or use a filter service, such as www.safeshare.tv, for actually viewing these links in the classroom. – Review the Gallery Walk protocol (see Appendix). • Post: Learning targets.

Lesson Vocabulary	Materials
main idea, neurological development, central idea, supporting details; (from "Teens and Decision Making") neurons (para. 3), electrochemical impulse (para. 3), neurotransmitters, (para. 3) prefrontal cortex (para. 6), limbic system (para. 6); (from homework) neurologist, pediatric neurologist, neuroscientists, frontal lobes, myelin or "white matter," neural insulation, brain chemistry, cognitive deficits, cognitive baseline	• Notices and Wonders note-catcher (one per student) • "I Forgot My Phone" (video; http://www.youtube.com/watch?v=OINa46HeWg8) • Digital projector • Gallery Walk items (for teacher reference; print and post items in advance) • Domain-Specific Vocabulary anchor chart (new; teacher-created) • "Teens and Decision Making: What Brain Science Reveals" (one per student) • Model Domain-Specific Vocabulary anchor chart (for teacher reference) • Informational Text Structure Map graphic organizer (one per student and one to display) • Document camera • Informational Text Structure Map graphic organizer (model, for teacher reference) • Neurologist's notebook #1 (one per student) • "Teen Brain—It's Just Not Grown Up Yet": Text and Questions (one per student) • Neurologist's notebook #1 (answers; for teacher reference)

Opening	Meeting Students' Needs
A. Entry Task (8 minutes) • Tell students that today they will participate in a Gallery Walk, during which they will listen to and examine diverse media (images, quotes, video) to better understand what this module will be about. • Distribute the **Notices and Wonders note-catcher**. Explain that during the Gallery Walk today, students should write anything they observe or that is new or interesting in the Notices column. Remind them this is not a space for judging the materials or giving their opinion. Rather, it is a space for observations. They also may find some of the information surprising or may have questions that are not answered in the image or quote. They can write these questions in the Wonders column. Tell them they also should try to figure out what they will learn about in this new module. • Explain they are going to practice using the note-catcher together once as a class. During the Gallery Walk they will be doing this activity in silence. • Play the video **"I Forgot My Phone"** at http://www.youtube.com/watch?v=OINa46HeWg8 with a **digital projector**. The video is about 2 minutes long. • Give students a few minutes to record their ideas on their Notices and Wonders note-catcher. • Ask students to turn and talk with a partner: * "What did you notice?" * "What did you wonder?"	• Allowing students to discuss with a partner before writing or sharing with the whole class is a low-stress strategy to help them process in a risk-free situation. • Checking in with learning targets helps students self-assess their learning. This research-based strategy supports struggling learners most.
B. Reviewing Learning Targets (2 minutes) • Refocus whole class. Ask a student to read the first learning target aloud: * "I can analyze photos, videos, and quotes to find a main idea." • Ask students to turn and talk with a different partner: * "What do you think the *main idea* of this video is?" * "Based on the entry task, what do you think might be a main idea of the module?" • Tell students that as they participate in the Gallery Walk and listen to and examine diverse media (images, quotes, video), they will better understand what this module will be about.	

Work Time	Meeting Students' Needs
A. Gallery Walk (10 minutes) • Review the Gallery Walk protocol with students as needed. Remind them of the norms for moving calmly around the room and moving to those images, quotes, and video where there are fewer classmates. Divide the class into small groups. • Give directions: Students will spend about 8 minutes silently wandering to each image, quote, or the video and writing down what they notice and what they wonder. They may linger at an item if they feel a need to do so. They need not worry about getting to all of them. Invite students to play the multimedia feature, which should already be on the class computer screen. Tell them that this feature runs about 2 minutes, but they do not have to stay for the whole 2 minutes. • Ask each small group to bring their Notices and Wonders note-catchers and a pen or pencil and stand by one of the **Gallery Walk items**. • Invite students to begin the Gallery Walk. Circulate to listen in and clarify procedures as needed. If all groups are working smoothly, consider participating in this step and writing your own Notices and Wonders. • After 8 minutes, invite students to sit and finish writing their thoughts. Focus them on the space at the bottom of the handout, where they can add to their initial thinking. • Refocus the whole group. Starting with Notices, allow students to "popcorn" discuss any of the ideas they have written down. • Repeat with Wonders, inviting students to discuss the questions that they have after the Gallery Walk. • Ask students to think silently about this question: * "What might the module be about?" • Have them turn and talk with their partner and share their idea. • Next, cold call students to share initial ideas and thoughts on what the module will be about. • Give students specific positive feedback for ways you saw them working well during the Gallery Walk or the discussion. Congratulate them for being willing to ask questions and think about information presented in diverse media; point out that this is something they will do a lot in this module. • Collect students' Notices and Wonders note-catcher (see Teaching Note; students will need these note-catchers again in Lesson 7).	

Work Time (continued)	Meeting Students' Needs
B. "Teens and Decision Making" (20 minutes) • Share the title of the module with the students: "This Is Your Brain—Plugged In." Tell students that in Unit 2 they will concentrate more on the "plugged in" part of this module. Here, in Unit 1, their reading will center on the *neurological development* of teenagers. They will need to learn a lot about how the brain works before they can think about how the brain is affected by being "plugged in." • Briefly discuss the prefix "neuro-" (meaning "nerve") and encourage students to look for words in their reading with that prefix. • Post the **Domain-Specific Vocabulary anchor chart** and write the phrase "neurological development." Remind students that domain-specific vocabulary includes words that are not necessarily common in everyday conversation. Instead, they would hear these words when talking about specific content, as in science or social studies class. Complex informational text often contains lots of domain-specific vocabulary words. Connect the purpose of the anchor chart to the first word you have placed on it: *neurological development*. Model how you know the definition of that phrase by saying something like: "I know the word 'develop' means to grow, and I know 'neuro' usually refers to the brain, so ..." • Distribute the **"Teen and Decision Making: What Brain Science Reveals."** Tell students it will give them important information regarding the adolescent brain. Today, they will hear this article read aloud as they read along in their heads. Set a clear purpose: Their task is to think about ideas in the article that seem important. Encourage students to underline any words they think are domain-specific words. • Read aloud the first eight paragraphs of "Teens and Decision Making"—which includes the introduction of this article as well as a section titled "The Teen Brain: Under Construction"—as students follow along in their heads. • Ask students to share any domain-specific vocabulary. Be sure they have identified *neurons*, *electrochemical impulse*, *neurotransmitters*, *prefrontal cortex*, and *limbic system*. • Prompt students to share what they think the definitions are and how they determined them. Remind students to reread the vocabulary in context. Point out that informational texts often restate the definition of a domain-specific word in a phrase right before or after the word (e.g., neurotransmitters). Write the answers on the anchor chart and clarify as needed by referring to the **Model Domain-Specific Vocabulary anchor chart (for teacher reference)**. Tell students they will continue to use this anchor chart throughout the module.	• When reviewing the graphic organizers or recording forms, consider using a document camera to display the document for students who struggle with auditory processing. • During read-alouds, read slowly, fluently, and without interruption or explanation while students look at the text and actively read. This promotes fluency and comprehension, because students are hearing and reading the text as a whole. To further support ELL students, consider providing definitions of challenging vocabulary in students' home language. Resources such as Google Translate and bilingual translation dictionaries can assist with one-word translation.

Work Time (continued)	Meeting Students' Needs

• Distribute the **Informational Text Structure Map graphic organizer** and use the **document camera** to display it. Explain that in Unit 1 students will be reading many informational texts. These texts, which often explain confusing topics, do so in a predictable way. Knowing a little about the structure of an informational text will help the students as readers and writers. They should think of it as a map. Knowing where you are on a map can help you make more sense of where you are going.
• Tell students that complex texts, like this one, often require rereading. Reread the first two paragraphs. Pause and ask:
  * "What is the purpose of this paragraph? What is the writer trying to do?"
• Listen for students to say that the author is using an anecdote or story to introduce his topic.
• Write this information in the Introduction box of the Informational Text Structure Map graphic organizer, referring to the **Informational Text Structure Map graphic organizer (model, for teacher reference)** as needed.
• Next, reread the third paragraph. Pause and ask:
  * "What is the purpose of this paragraph?"
  * "Has the author begun to explain his main idea yet?"
• Listen for students to say that this paragraph gives some necessary background that the reader needs in order to understand the main idea. If necessary, prompt students to reread the title, which provides a clue about the focus of the article.
• Point out the Background box on the Informational Text Structure Map graphic organizer. Explain to students that authors often take a detour into some background information, especially when they are talking about a complex subject like the human brain. This little detour is not yet the main idea of the article, but it is very important to understanding the main idea. Write: "Brief history or background to give the reader context."
• Reread the fourth paragraph. Pause and ask:
  * "What is the purpose of this paragraph?"
• Listen for students to say that this paragraph connects the background to the main focus of the article—the way a teenager makes decisions. It acts as a "bridge." Prompt students with questions such as: "This is the end of introduction. What do we often find at the end of an introduction?"	

Work Time (continued)	Meeting Students' Needs
• Ask students to underline a sentence that points them toward the main idea. Prompt them to reread the title to make sure their sentence relates to the title. Remind them that as writers, they know that in the beginning of text, the writer will give the reader a focus or a thesis statement. Point out that in informational articles, the reader often has to read the whole thing before she or he can know the main idea for sure, but looking for hints along the way is good practice. • Have the students notice the subheadings. Explain that subheadings are a good sign they are entering a supporting chunk of information. • Reread the section titled "The Teen Brain: Under Construction." Identify helpful features of supporting idea/details paragraphs like quotes from experts. Refer to the Model Informational Text Structure Map graphic organizer (for teacher reference) as needed. • After finishing, have students think about and then talk with a partner: * "Based on just this initial read, what are two important ideas from the article?" • Reiterate that they will work with this article again in Lesson 2, and their thinking certainly will deepen and change as they understand the text more fully.	

Closing and Assessment	Meeting Students' Needs
A. Introducing the Neurologist's Notebook (5 minutes) • Tell students that while they are reading informational texts about the neurological development of teens, they will use a neurologist's notebook to write down the main ideas and details in the sections of text that they read for homework. • Distribute **neurologist's notebook #1** and display a copy on the document camera. Remind students that they have kept similar types of reader's notebooks in other modules. Quickly discuss the meaning of the word *neurologist* with "-logos," meaning "knowledge or study of." Explain that this notebook is called the "neurologist's notebook" because that is what they are—people who study and learn all about the brain. • Review the structure and purpose of these notes. They first will read the article and then write down the main idea of what they read and any supporting details. Point out that this note-catcher mirrors the Informational Text Structure Map graphic organizer. • Ask students to think and discuss with a partner: * "What is a main idea, and what is a supporting idea/detail?" • Cold call on students to explain their thinking. Listen for them to define main idea, also called a *central idea*, as "what the article is mostly about" or "the big idea," and *supporting details* as "the smaller ideas and facts that explain and clarify the main idea," "reasons to support the main idea," and "facts or other information that relate to the main idea and make it clearer and more complete." • Point out that there will often be vocabulary words that are part of the reading. Sometimes the definitions will be given, but most of the time they will be words students must figure out based on context clues. • Answer any clarifying questions. • Distribute **"The Teen Brain—It's Just Not Grown Up Yet": Text and Questions** . Explain that the right-hand column of the paper will help them stop and think while they are reading.	• Some students may benefit from having key sections pre-highlighted in their texts. This will help them focus on small sections rather than scanning the whole text for answers.
Homework	**Meeting Students' Needs**
• Read "The Teen Brain—It's Just Not Grown Up Yet" and use the questions that are to the right of the text to help you synthesize your learning. Fill out neurologist's notebook #1.	

EXPEDITIONARY LEARNING

Grade 7: Module 4A: Unit 1: Lesson 1
Supporting Materials

Notices and Wonders Note-catcher

Name:

Date:

Notices	Wonders

Notices and Wonders Note-catcher

My initial thoughts:

1. What do you think are some of the ideas that we will explore in this module?

2. Which Gallery Walk item made you most curious to learn more? Why?

Gallery Walk Items
(For Teacher Reference)

Items 1–13 are essential. Items 14–19 are included as optional pieces, depending on space and class size.

Item 1
image of a neuron
http://commons.wikimedia.org/wiki/File:Neuron-figure-notext.svg
Photo by Nicolas.Rougier
Creative Commons GNU Free Documentation License

Item 2
"Students and Technology: Constant Companions"
multimedia feature
http://www.nytimes.com/interactive/2010/11/21/technology/20101121-brain-interactive.html?ref=technology

Item 3
"The Child's Developing Brain"
interactive feature
http://www.nytimes.com/interactive/2008/09/15/health/20080915-brain-development.html

Item 4
"Ask two media questions and provide age-appropriate counseling for families at every well-child visit: How much recreational screen time does your child or teenager consume daily? Is there a TV set or an Internet-connected electronic device (computer, iPad, cell phone) in the child's or teenager's bedroom?" —AAP Recommendations

Item 5
"If I had to live my life again, I would have made a rule to read some poetry and listen to some music at least once a week; for perhaps the parts of my brain now atrophied could thus have been kept active through use." —Charles Darwin

Item 6
"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." --Richard Knox

Gallery Walk Items
(For Teacher Reference)

Item 7
Find a definition of addiction and display for students.

Item 8
Image of people playing video games
http://www.flickr.com/photos/wlodi/2254657082/
Photo by włodi
Creatve Commons Share Alike 2.0

Item 9
"There are billions of neurons in our brains, but what are neurons? Just cells. The brain has no knowledge until connections are made between neurons. All that we know, all that we are, comes from the way our neurons are connected." —Tim Berners-Lee

Item 10
"The brain is not the mind. It is probably impossible to look at a map of brain activity and predict or even understand the emotions, reactions, hopes, and desires of the mind." —David Brooks

Item 11
"Vishal has mixed feelings about technology. 'If it weren't for the Internet, I'd focus more on school and be doing better academically,' he says. But thanks to the Internet, he says, he's discovered and pursued his passion: filmmaking.
"Vishal often spends hours working on music videos or film projects with sophisticated film editing software that he taught himself how to use—and then he's focused in a way he rarely is when doing homework. He hopes colleges will be so impressed by his portfolio that they'll overlook his school performance." —Matt Richtel

Item 12
Cascading Consequences chart
Use sample anchor chart from Lesson 13, Unit 2.

Gallery Walk Items
(For Teacher Reference)

Item 13
Leisure time chart
http://cdn.theatlantic.com/static/mt/assets/business/Screen%20Shot%202012-06-25%20at%205.17.46%20PM.png
Bureau of Labor Statistics, American Time Use Survey 2012

Optional items depending on space and class size:

Item 14
"What are the implications for good or ill, of the dramatic changes in the way adolescents spend their time?" —Dr. Jay Giedd

Item 15
"Children use the fist until they are of age to use the brain." —Elizabeth Barrett Browning

Item 16
image of prefrontal cortex
http://commons.wikimedia.org/wiki/File:Ptsd-brain.png
Photo by National Institutes of Health

Item 17
cross-section of brain compared to a simple brain
http://en.wikipedia.org/wiki/File:Vertebrate-brain-regions.png
Photo by SW Ranson. 1920. Public Domain

Item 18
image of an fMRI
http://en.wikipedia.org/wiki/File:MRI-Philips.JPG
Photo by Jan Ainali http://upload.wikimedia.org/wikipedia/commons/e/ee/MRI-Philips.JPG Creative Commons 3.0 unported license

Item 19
image of a baby playing with an iPad
http://www.flickr.com/photos/humboldthead/4871746829/
Photo by Humbolthead http://www.flickr.com/photos/humboldthead/4871746829/ Creative Commons 2.0 license

"Teens and Decision Making"

Teens and Decision Making: What Brain Science Reveals
Anonymous
New York Times Upfront; Apr 14, 2008; 140, 13; ProQuest Research Library
pg. 18

HEADS UP
REAL NEWS
ABOUT DRUGS
AND YOUR BODY

A Message from Scholastic and The National Institute on Drug Abuse (NIDA)

Teens and Decision Making: *What Brain Science Reveals*

Do you ever act before thinking? Have you ever wondered why? Do you worry this might create problems? If you answered "yes" to any of these questions, read on.

Picture this: Your finger is poised on the *send* button, your eyes scanning an angry e-mail you've dashed off to a friend who has upset you. Some things you've written are a little harsh. In your brain a little red light goes off, but, what the heck, you're steamed and your friend deserves it. You push the button.

Whether you're aware or not, rushed decisions like this—acting before *thinking it through*—happen more often in teens than in adults. Recent discoveries in brain science may help explain why this is so.

First, a bit on how a brain makes decisions. Decisions don't "just happen" automatically in your conscious mind. They stem from a series of events in the brain, which happen almost instantaneously. This involves a relay system in which different structures—made up of specialized cells called neurons—talk with each other by way of electrochemical impulses and chemical messengers, called neurotransmitters. Information flowing through this decision-making circuit is analyzed in the different structures. Then the network, as a whole,

Photo: © Denis Felix/Getty Images

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puts out a response. This output provides the basis for our behaviors and actions.

While this process is basically the same for teens and adults, the devil is in the details. Since the brain is not fully developed until the early 20s, the way in which a teen's decision-making circuit integrates information may put him or her at a higher risk of making decisions the teen could later regret.

THE TEEN BRAIN: Under Construction

Not long ago, scientists thought the human brain was fully mature long before the teen years. While research shows that one's brain reaches its maximum size between ages 12 and 14 (depending on whether you are a girl or a boy), it also shows that brain development is far from complete. Regions of the brain continue to mature all the way through a person's early 20s.

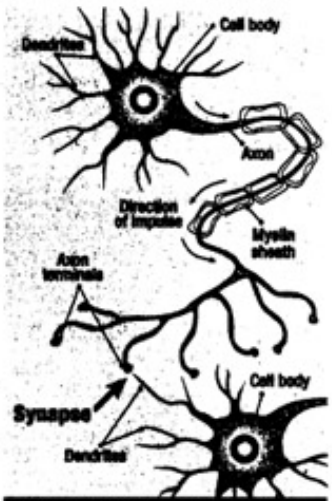
A key brain region that matures late is the **prefrontal cortex**, located directly behind your forehead. The prefrontal cortex is very important as a control center for thinking ahead and sizing up risks and rewards. (This area is, in fact, the little red light that was trying to warn you about sending that e-mail.) Meanwhile, another part of the brain that matures earlier is the **limbic system**, which plays a central role in emotional responses.

Since the limbic system matures earlier, it is more likely to gain an upper hand in decision making. This relationship between the emotional center (limbic system) and control center (prefrontal cortex) helps to explain a teen's inclination to rush decisions. In other words, when teens make choices in emotionally charged situations, those choices are often more weighted in *feelings* (the mature limbic system) over *logic* (the not-yet-mature prefrontal cortex).

This is also why teens are more likely to make "bad" choices, such as using drugs, alcohol, and tobacco—all of which pose a risk of serious health consequences. "Most kids don't really 'plan' to use drugs," says Professor Laurence Steinberg of Temple University, "at least not the first time. They are more likely to experiment *on the spur of the moment*, particularly when influenced by others [peer pressure]."

FINE-TUNING THE BRAIN

Like the rest of the body, the brain needs to mature in order to reach peak performance. This process involves slow changes—strongly influenced by brain activity—that have evolved to fine tune (or optimize) how neural impulses flow throughout the brain, allowing it to process information faster and more reliably.



A synapse is the small space where an axon and dendrite exchange information.

Inside the brain, information travels through a network of neurons, which have thread-like fibers called *axons* and branch-like structures called *dendrites*. Dendrites bring information into the neurons, while axons take it away and pass it along to the next neuron. Thus, neurons are assembled into circuits where the far end of an axon (its terminal) is positioned close to a dendrite. The small space between the two is called a **synapse**—where information is exchanged.

Throughout childhood and adolescence, the brain is busy fine-tuning itself through two key processes: myelination and synaptic pruning.

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"Teens and Decision Making"

In **myelination**, axons wrap themselves in a fatty substance (myelin sheath), which works like the insulating plastic that surrounds electrical wires. This boosts the brain's efficiency by increasing the speed with which a signal travels down the axon by up to 100 times. In **synaptic pruning**, synapses not used very often are removed, allowing the brain to redirect precious resources toward more active synapses. This strategic loss of weak synapses shapes the brain and makes it more efficient. This important pruning process molds the brain in response to a person's experiences and activities.

This means that teens have the potential, through their choices and the behaviors they engage in, to shape their own brain development—strengthening some circuits and getting rid of others. This makes the type of activities teens are involved in especially important. Skill-building activities, such as many physical, learning, and creative endeavors, not only provide stimulating challenges, but can simultaneously build strong brain pathways. When teens learn and repeat appropriate behaviors, they are helping to shape their brains—and their futures.

WAIT A MINUTE!

Learning how your brain works can help explain why sometimes you behave like you do. With this knowledge, you can be better equipped to make smart choices.

One tip to follow is to *take a moment* before acting. When making a decision, something as simple as stopping to think can mean the difference between a positive and a negative outcome. By waiting a minute before acting, you allow yourself to:

- consider consequences;
- weigh harmful outcomes (e.g., harm to yourself or others) against short-term benefits (e.g., fitting in or feeling high);
- determine whether peer pressure is making you do something you'd otherwise not do;
- get information or advice, if you need it.

For more information about drugs and your body, visit **http://teens.drugabuse.gov** and **www.scholastic.com/headsup**.

To learn more about "pausing" to allow yourself to make smart choices, check out **www.myspace.com/pause**.

Vocabulary

Match each word in Column A to its meaning in Column B.

Column A	Column B
1. synapse	A. brain area important for thinking ahead and sizing up risk and reward
2. myelination	B. process in which axons become wrapped up in fatty myelin sheath
3. prefrontal cortex	C. brain system that plays a central role in emotional responses
4. limbic system	D. the small space between axons and dendrites where neurons exchange information
5. synaptic pruning	E. cutting back the number of synapses

Photo: © Fancy/Veer

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Domain-Specific Vocabulary Anchor Chart

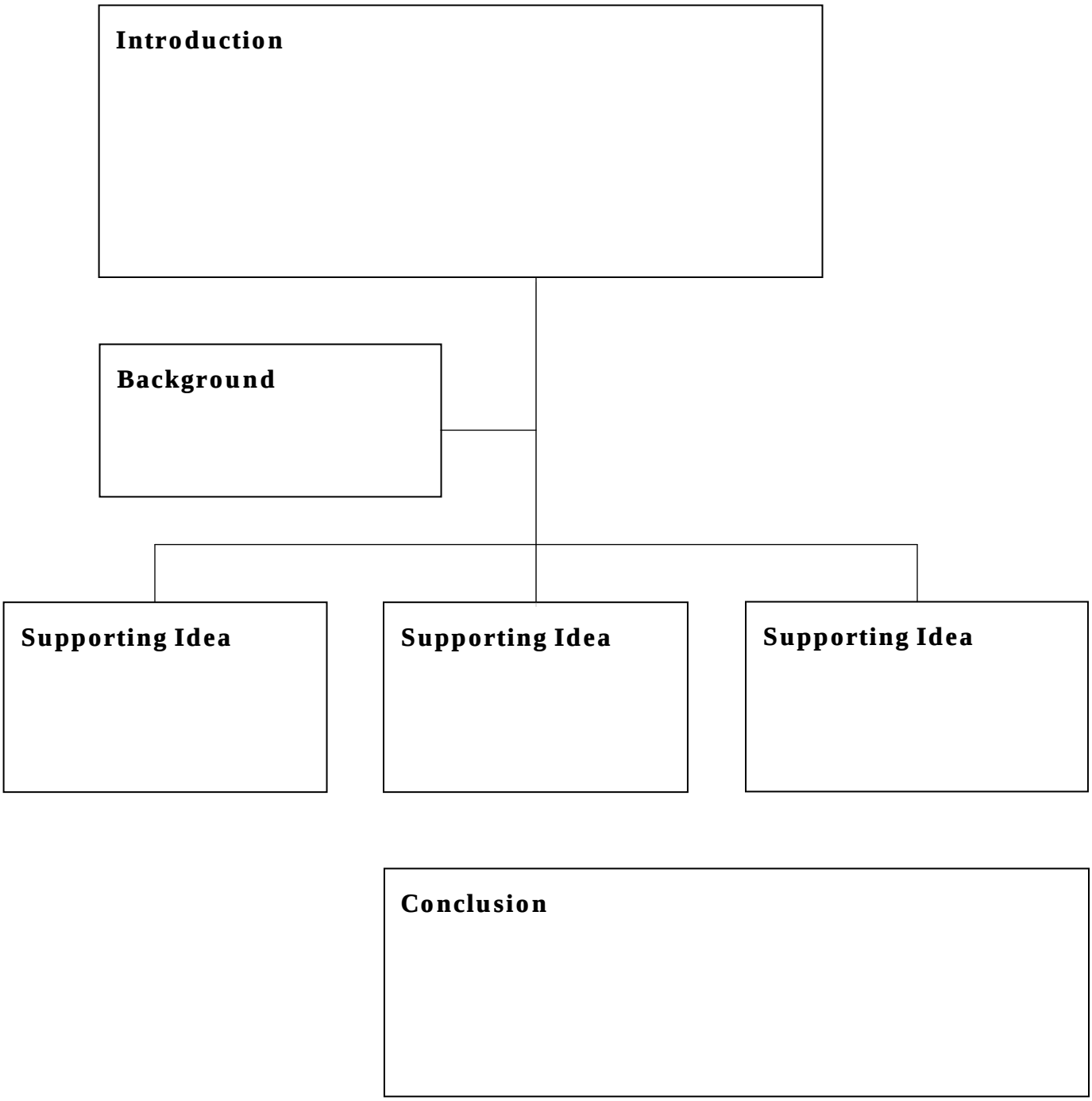
Word	Definition

Model Domain-Specific Vocabulary Anchor Chart

(For Teacher Reference)

Word	Definition
neurological development	the way the brain and nervous system grow and get more mature
neurons	specialized cells in the brain
electrochemical impulse	a signal that is both electric and chemical
neurotransmitters	chemical messengers that help to carry the signal in the brain
prefrontal cortex	a region of the brain that is important for sizing up risk and thinking ahead
limbic system	a brain system that plays a central role in emotional response
neurologist	someone who studies the brain

Informational Text Structure Map Graphic Organizer



Informational Text Structure Map Graphic Organizer
(Model, For Teacher Reference)

Introduction
Often starts with an **anecdote** or something the readers can visualize

Introduces **main idea** (in some texts, may not be clear until you have read the entire article)

Hint: Look for questions that focus the rest of the article

Brief **history** or background to give the reader context

Supporting Idea
Hint: Look for section titles—they clue the reader in

Includes Evidence

Often includes **quotes** from experts as evidence

Supporting Idea
See other box

Supporting Idea
See other box

Each supporting idea relates to the main idea in different ways

Conclusion

Often answers the question "So what?" or gives the reader more questions to think about

Neurologist's Notebook #1:
"Teen Brain—It's Just Not Grown Up Yet"

Name:

Date:

Directions: Use this note-catcher to get the gist of the reading. Remember that the main idea and supporting idea/details are often not just a single sentence of the text; rather, they may involve multiple sentences.

Main idea:	
Brief background:	Supporting idea/detail:
Supporting idea/detail:	Supporting idea/detail:
Supporting idea/detail:	Supporting idea/detail:

Neurologist's Notebook #1:
"Teen Brain—It's Just Not Grown Up Yet"

Vocabulary

Word	Definition	Context clues: How did you figure out this word?
pediatric neurologist		
neuroscientists		
frontal lobes		
myelin or "white matter"		
neural insulation		
brain chemistry		
cognitive deficits		
cognitive baseline		

Neurologist's Notebook #1:
"Teen Brain—It's Just Not Grown Up Yet"
(Answers, For Teacher Reference)

Name:

Date:

Directions: Use this note-catcher to get the gist of the reading. Remember that the main idea and supporting details are often not just a single sentence of the text; rather, they may involve multiple sentences.

Main idea: **Knowing how the teen brain works was helpful to Dr. Jensen and her sons.**	
Brief background: **The nerves that connect the frontal lobe to the rest of the brain are still being coated by neural insulation.**	Supporting idea/detail: **Because their frontal lobes are partially connected, teenagers may make bad decisions and not have the insight to think of other people.** **This helped Dr. Jensen understand her sons' behavior.**
Supporting idea/detail: **Teens' brains are also excitable, and this makes them more vulnerable to addiction.**	Supporting idea/detail: **Drugs affect the teen brain longer. This helped Dr. Jensen's son know why not to smoke pot.**
Supporting idea/detail: **Everyone needs sleep to remember things they learn. This helped Dr. Jensen's sons have better study habits.**	Supporting idea/detail: **(intentionally blank)**

Neurologist's Notebook #1:
"Teen Brain—It's Just Not Grown Up Yet"
(For Teacher Reference)

Vocabulary

Word	Definition	Context clues: How did you figure out this word?
pediatric neurologist	**A doctor who studies the nervous system of children**	
neuroscientists	**Someone who studies the brain**	
frontal lobes	**A region of the brain behind the forehead**	
myelin or "white matter"	**A material that coats the outside of nerve cells**	
neural insulation	**Another way of saying myelin**	
brain chemistry	**The chemicals in the brain**	
cognitive deficits	**Lacking in the ability to think or understand**	
cognitive baseline	**Having the standard ability to think or understand**	

"The Teen Brain: It's Just Not Grown Up Yet": Text and Questions

Directions:
Please read the article below. As you read, use the Informational Text Structure Map graphic organizer and the right-hand column to help guide your thinking. Read the entire article before you write anything on the neurologist's notebook. Then go back and look at your gist notes as you fill in the notebook entry.

The Teen Brain: It's Just Not Grown Up Yet by Richard Knox

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.	This is the introduction. What is the anecdote that helps introduce this topic? Underline the sentence that helps you focus on the central idea. Hint: Wait to write the central idea on the neurologist's notebook until you have read the whole article once.

http://www.npr.org/templates/story/story.php?storyId=124119468

"The Teen Brain: It's Just Not Grown Up Yet": Text and Questions

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.	Here is the background information that the reader needs. Take gist notes here.

"The Teen Brain: It's Just Not Grown Up Yet": Text and Questions

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.	From this subtitle you know this section will focus on supporting details about the frontal lobe (this includes the prefrontal cortex). Take gist notes about what you learn.

http://www.npr.org/templates/story/story.php?storyId=124119468

"The Teen Brain: It's Just Not Grown Up Yet": Text and Questions

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.	Look at the subtitle. This is the focus of this section. Take gist notes about what in the teen brain makes it vulnerable to addiction. Ask yourself: How do the supporting details is this section relate to the central idea?

"The Teen Brain: It's Just Not Grown Up Yet": Text and Questions

Now that you have read and thought about the article, go back and ask yourself:

If I had to describe this article in one sentence, what would I say?
Write that **main idea** in the box in neurologist's notebook #1.

What was the basic background information summed up in one or two sentences?
Write that in the **background** box in neurologist's notebook #1.

As you fill in the **supporting ideas/detail** boxes in neurologist's notebook #1, ask yourself:

What about the partially connected frontal lobe was important? How might that relate to the main idea?

What else about the teen brain makes it different from an adult's? Why is this important to the main idea?

How do the examples from the Jensen family's life fit into the main idea?