



EXPEDITIONARY
LEARNING

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

Close Reading: Excerpt 3 of “The Digital Revolution and the Adolescent Brain Evolution”



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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 read above-grade-level texts with scaffolding and support. (RI.7.10)

I can use a variety of strategies to determine the meaning of unknown words or phrases. (L.7.4)

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)

Supporting Learning Targets

- I can identify text-based evidence that does or does not support the main idea of an informational text.
- I can read “The Digital Revolution and the Adolescent Brain Evolution” with support.
- I can analyze photos, video, and quotes to find a main idea.

Ongoing Assessment

- Excerpt 3 of “The Digital Revolution and the Adolescent Brain Evolution” text-dependent questions
- Thinking Logs



Agenda	Teaching Notes
<ol style="list-style-type: none">1. Opening<ol style="list-style-type: none">A. Analyzing the Evidence Entry Task (5 minutes)2. Work Time<ol style="list-style-type: none">A. Close Reading of Excerpt 3 (18 minutes)B. Revisit Gallery Walk (15 minutes)3. Closing and Assessment<ol style="list-style-type: none">A. Thinking Log (7 minutes)4. Homework<ol style="list-style-type: none">A. Read Homework: Excerpt 4 of “The Digital Revolution and the Adolescent Brain Evolution” and answer the questions.B. Continue to read your independent reading book.	<ul style="list-style-type: none">• In this lesson, students continue to read excerpts from “The Digital Revolution and the Adolescent Brain Evolution.” See the Teaching Notes from Lesson 5 for more about this text.• This excerpt centers on the effects of video games on the brain. Because students will be reading several texts in Unit 2 about video games, today’s learning will be important. Be sure to take the time in Work Time A to record key information on the class Brain Development anchor chart. Students will continue to focus on the last column of their anchor chart, writing “if/then” statements. This practice will scaffold the students toward creating their position paper in Unit 3. Be sure to emphasize that they should use words and phrases like “may” and “it seems reasonable” to mirror the cautionary tone of scientists.• Students will revisit the Gallery Walk from Lesson 1 to think about what they now know and what they still would like to understand better. This reflective process helps them build on new understandings. A self-monitoring or metacognitive approach can help students develop the ability to take control of their own learning, define learning goals, and monitor their progress.• As in the Gallery Walk in Lesson 1, item 1 is a short video, which students can watch on a computer in the classroom. Cue up the Web page before class starts so that students can click “play” as they get to the station. Choose whether students will use headphones or listen at the station in small groups (quietly so that it will not disrupt others).• The lesson opens with an activity that is designed to help students progress toward RI.7.1. Students weed out irrelevant evidence that does not support the main idea of the text they read in Lesson 6. This is patterned after one of the questions on the end of unit assessment. If you find your students struggling with this, you may want to take more time on this portion of the lesson.• In advance:<ul style="list-style-type: none">– Load the multimedia feature from the <i>New York Times</i> Web site: http://www.nytimes.com/interactive/2010/11/21/technology/20101121-brain-interactive.html?ref=technology.



Agenda	Teaching Notes (continued)
	<ul style="list-style-type: none">– Prepare the Gallery Walk:<ul style="list-style-type: none">• 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 around the room in a way that will allow students to move freely and comfortably from one item to the next.• Item 2 is the multimedia feature from the <i>New York Times Website</i>, which can be cued up at a computer station, but will also need to be viewed as a whole class using a digital projector.– Review the Gallery Walk protocol (see Appendix).• Post: Learning targets.



Lesson Vocabulary	Materials
(from Excerpt 3): socioeconomic, ubiquitous (section 2), encompass, interpersonal formats, infinitely scalable (section 3), predominant molecular currency, nucleus accumbens, commonality (section 4)	<ul style="list-style-type: none">• Analyzing the Evidence entry task (one per student)• Excerpt 3 of “The Digital Revolution and the Adolescent Brain Evolution” (one per student)• Excerpt 3 of “The Digital Revolution and the Adolescent Brain Evolution” text-dependent questions (one per student; one to display)• Excerpt 3 of “The Digital Revolution and the Adolescent Brain Evolution” Close Reading Guide (for teacher reference)• Document camera• Brain Development anchor chart—student version (begun in Lesson 2)• Brain Development anchor chart (begun in Lesson 2)• Model Brain Development anchor chart (for teacher reference)• Notices and Wonders note-catcher (begun in Lesson 1)• “Students and Technology: Constant Companions” (multimedia feature; http://www.nytimes.com/interactive/2010/11/21/technology/20101121-brain-interactive.html?ref=technology) (From The New York Times, November 20, 2010 © 2010 The New York Times. All rights reserved. Used by permission and protected by the Copyright Laws of the United States. The printing, copying, redistribution, or retransmission of this Content without express written permission is prohibited.)• Digital projector• Gallery Walk items (from Lesson 1)• Thinking Log (begun in Lesson 2)• Homework: Excerpt 4 of “The Digital Revolution and the Adolescent Brain Evolution” (one per student)



Opening	Meeting Students’ Needs
<p>A. Analyzing the Evidence Entry Task (5 minutes)</p> <ul style="list-style-type: none">• Distribute the Analyzing the Evidence entry task. Ask students to complete it individually.• After a few minutes, ask students to raise their hand if they can identify the piece of evidence that does not support the main idea. Call on several students. Listen for them to identify the letter “d” as the piece that does not explain that neurons change according to task and environment.• Direct students’ attention to the learning targets.<ul style="list-style-type: none">* “I can identify text-based evidence that does or does not support the main idea of an informational text.”* “I can read ‘The Digital Revolution and the Adolescent Brain Evolution’ with support.”* “I can analyze photos, video, and quotes to find a main idea.”• Tell students the entry task asked them to weed out irrelevant evidence—that is, a quote that did not support the main idea. Ask students to write at the top of the entry task a number from 1 to 5. They should write a 1 if they were very confused and could not identify the piece of evidence that failed to support the main idea. They should write a 5 if they found the piece of evidence quickly and easily.• If time permits, ask a student who wrote a 5 to explain her thought process during the entry task. Alternatively, you could collect this entry task and use it to inform your teaching.• Explain that the text-dependent questions they will do next will help them read “The Digital Revolution and the Adolescent Brain Evolution.”	<ul style="list-style-type: none">• Checking in with learning targets helps students self-assess their learning. This research-based strategy supports struggling learners most.



Work Time	Meeting Students’ Needs
<p>A. Close Reading of Excerpt 3 (18 minutes)</p> <ul style="list-style-type: none"> Distribute Excerpt 3 of “The Digital Revolution and the Adolescent Brain Evolution.” Tell students that they will read this excerpt with support. Also distribute Excerpt 3 of “The Digital Revolution and the Adolescent Brain Evolution” text-dependent questions and display a copy on a document camera. Work through this handout in concert with Excerpt 3 of “The Digital Revolution and the Adolescent Brain Evolution” Close Reading Guide. (Be sure to save time for students to add to the anchor chart). Invite students to retrieve their Brain Development anchor chart—student version and focus their attention on the class Brain Development anchor chart. Tell them that you would like to get this information onto the anchor chart. Do so, using the Model Brain Development anchor chart (for teacher reference) as needed. Consider writing something like this in the limbic system column: <ul style="list-style-type: none"> – “Dopamine is the main neurotransmitter in the limbic system” (Giedd) – “Dopamine flushes the limbic system during basic biological drives, by substance abuse, and addictive behaviors. It is also activated by video games.” (Giedd) Ask students to turn and talk about what to write in the last column: <ul style="list-style-type: none"> * “Create ‘if/then’ statements from the information we learned about the video games, dopamine, and the limbic system.” After 1 minute, ask students to share out. Use the class discussion to add to the anchor chart and invite students to record the information on their own anchor charts. Consider writing something like this: <ul style="list-style-type: none"> – “<u>If</u> video games activate dopamine in the brain similarly to addictive behaviors, <u>then</u> a person may become addicted to video games in the same way someone can be addicted to behaviors.” 	<ul style="list-style-type: none"> Consider partnering ELL students who speak the same home language when discussion of complex content is required. This can allow students to have more meaningful discussions and clarify points in their native language.
<p>B. Revisit Gallery Walk (15 minutes)</p> <ul style="list-style-type: none"> Distribute students’ filled-in Notices and Wonders note-catcher from Lesson 1. Direct students’ attention to the multimedia feature “Students and Technology: Constant Companions” cued up on the digital projector. Explain that they will do one notice and wonder together before they work independently in the Gallery Walk. Tell students to notice how this relates to the ideas explored in their close reading today. Play the audio under “A Shot of Energy: Ramon Ochoa Lopez.” The audio is 1 minute, 28 seconds. 	<ul style="list-style-type: none"> Protocols such as a Gallery Walks are an engaging opportunity for students to reflect on their own learning. Developing reflection supports all students, but research shows it supports struggling learners most.



Work Time (continued)	Meeting Students’ Needs
<ul style="list-style-type: none">• Give students a minute to write down their thoughts. Then cold call on students. Listen for them to say that the reason Ramon loves video games is the dopamine in his brain—the “shot of energy,” as he calls it. But they know that dopamine is also one of the neurotransmitters that a person can get “addicted to.” Perhaps they wonder if Ramon is addicted to video games. Remind students that the word “addiction” is defined in the Gallery Walk.• Tell students they will re-examine the Gallery Walk items from Lesson 1, including quotes, images, and the video. Some of the information will now seem familiar, but some might still be new and interesting; students should add anything they observe, or that is still new or interesting, in the Notices column. They also may still find some of the information surprising or may have additional questions that are not answered in the image or quote. They can add any questions in the Wonders column.• Review the Gallery Walk protocol as needed and get students in small groups with their note-catchers to begin.• Ask them to silently wander to each image, quote, or the video and write down what they notice and what they wonder for about 8 minutes. They may linger at any item and not worry about getting to all the items. Invite students to play multimedia feature from the <i>New York Times Website</i> at the computer station. They can revisit Ramon’s audio or play any other student’s audio. Remind students of the norms for moving calmly around the room and moving to the images, quotes, or video where there are fewer classmates.• Invite students to begin the Gallery Walk. Consider participating in this step and writing your own notices and wonders. Or circulate to listen in and clarify procedures as needed.• After 8 minutes, invite students to sit and finish writing their thoughts, especially adding to their thinking at the bottom of the note-catcher. Starting with notices, allow students to “popcorn” discuss any of the ideas they have written down. Next, invite them to “popcorn” discuss the questions that they still have after the Gallery Walk. Tell them that their questions may become research questions for Unit 2. Collect the Notices and Wonders note-catchers.• Congratulate students on how much they have learned about adolescent brain since Lesson 1. Point out specific learning that students didn’t know in the first Gallery Walk but did know in the second, as well as deeper and/or different questions formed based on greater understanding of the adolescent brain.	



Closing and Assessment	Meeting Students’ Needs
<p>A. Thinking Log (7 minutes)</p> <ul style="list-style-type: none">• Ask students to retrieve their Thinking Logs. Then have them pair up and discuss this question before writing:<ul style="list-style-type: none">* “How has revisiting the resources in the Gallery Walk clarified your thinking about adolescent brain development?”• Then have students respond in their Thinking Log (Lesson 7).• Time permitting, cold call students to share their current thinking.	
Homework	Meeting Students’ Needs
<ul style="list-style-type: none">• Read Homework: Excerpt 4 of “The Digital Revolution and the Adolescent Brain Evolution” and answer the questions. Use the scaffolding steps to help you.• Continue to read your independent reading book.	



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Supporting Materials



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Analyzing the Evidence:
Entry Task

Name:

Date:

Directions:

In Lesson 6, you learned about the adaptability of the brain. You learned that the brain is very adaptable because it literally, physically changes. Its neurons change to fit the tasks it needs to perform in order to thrive in whatever environment it is in.

These are all pieces of evidence from texts throughout Unit 1. Most of the following pieces of evidence support your learning from Lesson 6. **Which one of these does not?** Circle the letter and explain why in the space below.

- a) “For instance, if you play guitar every day, your brain will have more fine-motor synapses than if you spend your time listening to Fall Out Boy on your MP3 player (in that case, audio synapse would rule).” (Bernstein)
- b) “This means that teens have the potential, through their choices and behaviors they engage in, to shape their own brain development—strengthening some circuits and getting rid of others. This makes the kind of activities that teens are involved in especially important.” (Scholastic)
- c) “Your experiences and the people you affiliate with shape the way your brain ultimately develops.” (Galván)
- d) “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.” (Knox)
- e) “When you review or practice something you’ve learned, dendrites actually grow between nerve cells in the network that holds that memory.” (Willis)



Excerpt 3 of “The Digital Revolution and the Adolescent Brain Evolution”

Name: _____

Date: _____

From “Entertainment”	Gist Notes and Vocabulary
(1) The most common forms of digital entertainment are TV (4.5 hours/day), music (3 hours/day), and non-gaming use of computers (1.5 hours/day). Next most common are video games (1.25 hours/day)—from computers, the Internet, game consoles, or handheld/mobile devices.	
(2) Video games are a \$25 billion per year industry and are popular and available across socioeconomic status and gender—99% of teen boys and 94% of teen girls play video games on one or more of the above platforms. The amount of time spent on video games is increasing across all age groups as the quality and variety of games continues to improve and the availability of mobile devices becomes more ubiquitous .	socioeconomic= ubiquitous=seems to be everywhere
(3) Highly popular games encompass a wide range of genres, degree of intellectual demand, and solitary versus interpersonal formats . Game consoles such as Wii Fit and Kinect interact with body movement providing infinitely scalable physical challenges that blur the distinction between video gaming and conventional athletic endeavors.	Encompass= Interpersonal formats= infinitely scalable=it can always get higher or more challenging
(4) From a neurobiological perspective, the popularity of the games reflects their capacity to stimulate the brain’s reward circuitry. Dopamine is the predominant molecular currency of the reward system, and a key component of the circuitry is the nucleus accumbens . The commonality of reward circuitry across domains is striking. All of our basic drives (e.g., hunger, sex, sleep), all substances of abuse, and everything that may lead to addiction (i.e., compulsive behavior characterized by loss of control and continuation despite adverse consequences) increases dopamine in the nucleus accumbens.	Predominant molecular currency=the most often used Nucleus accumbens=a part of the brain that is part of the limbic system Commonality=

Geidd, Jay N., M.D. "The Digital Revolution and Adolescent Brain Evolution." National Center for Biotechnology Information. National Institute of Health, 5 Aug. 2012. Web. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3432415/>

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Excerpt 3 of “The Digital Revolution and the Adolescent Brain Evolution”:
Text-Dependent Questions

Questions	Notes
<p>1. What is the purpose of the first paragraph? Is it to define terms, identify a problem, illustrate a problem with an anecdote, or give background? Why?</p> <p>2. In the second paragraph, Dr. Giedd quotes the statistic that “99% of teen boys and 94% of teen girls play video games.” What statement does this evidence support?</p> <p>3. Compare the information in the second paragraph with the different information in the third. What do they have in common? How are they different?</p> <p>4. If you take out the parenthetical phrases of the last sentence, it reads: “All of our basic drives, all substances of abuse, and everything that may lead to addiction increases dopamine in the nucleus accumbens.”</p> <p>What do video games have in common with our basic drives, drugs, and addictive behaviors?</p>	



Excerpt 3 of “The Digital Revolution and the Adolescent Brain Evolution”:
Text-Dependent Questions

Questions	Notes
How might this relate to the main idea of this section that video games are popular?	



Excerpt 3 of “The Digital Revolution and the Adolescent Brain Evolution”:
Close Reading Guide
(For Teacher Reference)

Total Time: 15 minutes

Questions	Close Reading Guide
<ol style="list-style-type: none">1. What is the purpose of the first paragraph? Is it to define terms, identify a problem, use an anecdote to illustrate a problem, or give background? Why?2. In the second paragraph, Dr. Giedd quotes the statistic that “99% of teen boys and 94% of teen girls play video games.” Why statement does this evidence support?3. Compare the information in the second paragraph with the different information in the third. What do they have in common? How are they different?	<p>(7 minutes)</p> <p>Read the excerpt once.</p> <p>Then reread Paragraphs 1–3. Clarify any vocabulary in this section. You may wish to prompt with questions like these: <i>“Socioeconomic” was in your homework from Lesson 5. What did it mean?</i> <i>The sentence says “solitary versus interpersonal,” so interpersonal is the opposite of solitary. What does it mean?</i></p> <p>Ask the Questions 1–3 one at a time. For each question, ask students to think individually and then raise their hands when they know the answer. When most of the class has a hand up, cold call on several students to share out.</p> <p>Listen for students to say:</p> <ol style="list-style-type: none">1. <i>The purpose is to define terms. He starts defining different types of entertainment and then explains what he means by “video games.”</i>2. <i>That video games are very popular across gender.</i>3. <i>They are both about video games, but the second is about how popular they are while the third is about what kinds there are.</i>



4. If you take out the parenthetical phrases of the last sentence, it reads: “All of our basic drives, all substances of abuse, and everything that may lead to addiction increases dopamine in the nucleus accumbens.”

What do video games have in common with our basic drives, drugs, and addictive behaviors?

How might this relate to the main idea of this section that video games are popular?

(8 minutes)

Reread the last paragraph. Clarify the vocabulary with a question like this:

The base of this word is “common.” How does that help you?

Model rephrasing for the students. Rephrase the first sentence by saying something like: “When you look at it from a brain science perspective, you can see that video games are popular because they tap into our limbic system.”

Then say something like this: “The next sentence will tell us two important things about the reward system or limbic system. Raise your hand when you can identify them.”

Reread the second sentence and pause to let students identify the information. Ask students to share out. Listen for: *Dopamine is the main neurotransmitter in the reward system, and the nucleus accumbens is major part of the limbic system.*

Move on to Question 4. Reread the remainder of the paragraph. Ask the question. Give students time to think individually and then raise their hands when they know the answer. When most of the class has a hand up, cold call on several students to share out.

Listen for students to say:

Video games also increase dopamine levels in the reward center.

Because video games stimulate dopamine like our basic drives, drugs, and addictions, they can feel as addictive or as necessary as those. Therefore, because they make our brain feel this way, they are popular.



Model Brain Development Anchor Chart
(For Teacher Reference)

Note: This chart is filled out in different lessons. The bolded items are added in this lesson.

Other developmental information	Prefrontal cortex	Neurons	Limbic system	So what?
<p>The brain needs sleep to take things from your short-term memory to your long-term memory (Knox)</p> <p>Your brain does not fully develop until the mid-20s (Scholastic)</p>	<p>Also called the “frontal lobe” (Knox)</p> <p>This area helps with insight and understanding the effect of your behavior on someone else (Knox)</p> <p>Matures later than other parts of the brain (Scholastic)</p> <p>Right behind your forehead (Scholastic)</p> <p>Helps with thinking ahead and sizing up risk and reward (Scholastic)</p>	<p>“White matter” is called myelin, and it coats the nerves and makes them “communicate” more effectively (Knox)</p> <p>In order for your brain to make a decision, tiny specialized cells “talk” with each other through a series of neurotransmitters, like a circuit in a computer. Then the whole network puts out a response, which becomes your outward behavior. (Scholastic)</p>	<p>Develops earlier than the PFC (Scholastic)</p> <p>Plays a central role in your emotional response (Scholastic)</p> <p>Associated with decisions made in feeling (Scholastic)</p> <p>When teens make decisions in emotionally charged situations—this one weighs in heavily (Scholastic)</p>	<p>So <u>if</u> the PFC is not as efficient, <u>then</u> teens may make decisions without fully realizing long-term consequences. <u>If</u> they do that, <u>then</u> this can be good (they take daring risks) and bad (they take dangerous risks).</p>



Model Brain Development Anchor Chart
(For Teacher Reference)

Other developmental information	Prefrontal cortex	Neurons	Limbic system	So what?
		<p>Information travels from neuron to neuron by way of their axons and dendrites (Scholastic)</p> <p>The space between one neuron's axon and the other neuron's dendrites is called its synapse (Scholastic)</p> <p>To make the connection better, the axons wrap themselves in myelin through a process called myelination (Scholastic)</p>	<p>The limbic system in the teen brain is more sensitive to risk and reward and gets a bigger shot of dopamine in rewarding situations. So it is more biased toward seeking out new information. (Galván)</p> <p>Dopamine is the main neurotransmitter in the limbic system (Giedd)</p>	<p><u>If</u> video games activate dopamine in the brain similarly to addictive behaviors, <u>then</u> a person may become addicted to video games in the same way someone can be addicted to behaviors.</p> <p><u>If</u> the brain is branching and pruning in adolescence, <u>then</u> it is highly adaptable. (Giedd)</p>



Model Brain Development Anchor Chart
(For Teacher Reference)

Other developmental information	Prefrontal cortex	Neurons	Limbic system	So what?
		<p>Also, if a synapse isn't used often, it is pruned through synaptic pruning. Then that energy is redirected into more active synapse. (Scholastic)</p> <p>Synaptic pruning occurs based on the choices, the behavior, and the environment of an individual (Scholastic)</p>	<p>The limbic system is activated during basic biological drives, by substance abuse, and addictive behaviors. It is also activated by video games. Giedd</p>	<p><u>If</u> it adapted in the past, <u>then</u> it may adapt today. <u>If</u> it is adaptable, <u>then</u> it may be able to adapt the digital world.</p> <p>So <u>if</u> synapses are being pruned or strengthened by the activities that teens spend their time on, <u>then</u> teens can shape their brain. And <u>if</u> activities shape one's brain, <u>then</u> one should be mindful about the activities that one is doing. As Dr. Willis says, "Practice makes permanent."</p>



Homework: Excerpt 4 of “The Digital Revolution and the Adolescent Brain Evolution”

Name:

Date:

Directions: Please read the excerpt below. Then follow the scaffolding steps to summarize and rephrase the main idea.

From “Entertainment: Attention Economy”

In the fiercely competitive video game industry, top selling games are masterful at engaging our brain’s reward system. Homework is up against some challenging foes. Might the availability of technologies that can persistently keep dopamine levels so high raise the threshold for what our brains deem rewarding in terms of relationships, studying, or working toward other long-term goals that may not have immediate reinforcements?

Scaffolding steps:

1. Circle five words that you would benefit from reviewing their definition. Using a dictionary, context clues, or an adult, find the definition of those words.
2. Rewrite the gist of each sentence or phrase in your own words:
 - a) *In the fiercely competitive video game industry, top selling games are masterful at engaging our brain’s reward system.*
 - b) *Homework is up against some challenging foes.*
 - c) *Might the availability of technologies that can persistently keep dopamine levels so high ...*
 - d) *... raise the threshold for what our brains deem rewarding in terms of relationships, studying, or working toward other long-term goals that may not have immediate reinforcements?*

Geidd, Jay N., M.D. "The Digital Revolution and Adolescent Brain Evolution." National Center for Biotechnology Information. National Institute of Health, 5 Aug. 2012. Web. <<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3432415/>>



Homework: Excerpt 4 of “The Digital Revolution and the Adolescent Brain Evolution”

3. Now reread the paragraph again.

4. What is the problem Dr. Giedd is wondering about? Explain in your own words.

Bonus: Think about the words “attention” and “economy.” Explain what the title means.