BEST FOR ALL

We will set all students on a path to success.

ELA

Grade 7

Boot Camp

Student Materials

Week 2

Lessons
6, 7, and 8

Digital Revolution Text Structure Graphic Organizer

Abstract (This is a special feature of science writing. It's a brief summary of the issue, the research, the findings, and the recommendation.)

Introduction
(This is where the main idea or issue is introduced.)

What is the issue this paper will examine?
What are the questions that drive the research and inquiry?

History
(This is where the author gives relevant history to the issue or past experiments.)

What is relevant history of this issue?
How does this relate to what I already know about the brain?

Supporting Idea: **Education**
(These boxes are where the author examines research findings in key areas relating to the main idea.)

Supporting Idea: **Entertainment**
Why is it significant that video games increase dopamine levels in the brain?
What is a potential problem of humans spending attention on entertaining activities that raise dopamine levels to artificial levels?

Supporting Idea: Digital Revolution-Social

Why is the human brain a "social brain"?
What skills does a human being need in order to understand another person?

Conclusion
(In a science article, the conclusion is where the author interprets the research or findings, makes a claim, and suggests further areas of study. Remember, scientists use evidence to hone existing questions or create new ones—not necessarily to come up with "the answer.")

Excerpt 2 of "The Digital Revolution and the Adolescent Brain Evolution"

Name:

Date:

From "The Adolescent Brain: Evolution and Neurobiology"	Gist Notes and Vocabulary
(1) Humans, on the other hand, are remarkably adaptable. We can survive everywhere from the frigid North and South poles to the balmy islands on the equator. With technologies developed by our brains we can even live in **vessels orbiting** our planet. Survival skills in cold climates may **entail** learning how to find shelter and obtaining nutrients from hunting. In tropical climates it may be more a matter of avoiding certain predators or identifying which fruits are edible and which are toxic.	Vessels orbiting = Entail =
(2) The changes in demands across time are as striking as the changes across geography. Ten thousand years ago, a blink of an eye in evolutionary terms, we spent much of our time securing food and shelter. Modern humans now spend relatively little time and energy obtaining calories (a factor that may, through **epigenetic** or other factors, be related to earlier puberty and greater height/weight). Instead many of us spend the majority of our waking hours dealing with words or symbols—a particularly **noteworthy** departure given that reading, which is approximately 5,000 years old, did not even exist for most of human history.	Epigenetic = change in the function of cells that is not due to changes in the DNA Noteworthy = interesting
(3) Having a highly **plastic brain** is particularly useful during the second decade, when the evolutionary demands of adolescence—being able to survive independently and reproduce—rely critically on the ability to adapt.	plastic brain= plastic here means "able to be changed"

Excerpt 2 of "The Digital Revolution and the Adolescent Brain Evolution"

From "The Adolescent Brain: Evolution and Neurobiology"	Gist Notes and Vocabulary
(4) Insight into the neurobiology of the developing brain has been greatly enhanced by the **advent** of magnetic resonance imaging (MRI), which allows exquisitely accurate pictures of brain anatomy and **physiology** without the use of ionizing radiation. (5) After puberty the brain does not mature by growing larger; it matures by growing more **specialized**. **Gray matter volumes** during the first three decades of life follow an inverted "U" shaped developmental **trajectory** with peak size occurring at different ages in different regions. Total **cortical gray matter volume** peaks at around age 11 in females and 13 in males. The **complementary** mechanisms of overproduction/selective elimination allow the brain to specialize in response to environmental demands.	advent—the invention of physiology—the way the brain function Specialized = more suited to a specific purpose Gray matter volume = how many synapses there are in the brain Trajectory = path Cortical gray matter volume—how much gray matter there is in the brain Complementary =

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/>

Excerpt 2 of "The Digital Revolution and the Adolescent Brain Evolution":
Text-Dependent Questions

Questions	Notes
In section 1, Dr. Giedd writes, "Humans, on the other hand, are remarkably adaptable." 1. What does it mean to be *adaptable*? 2. What evidence does he give to support this statement? Later in section 1, Dr. Giedd gives another example of *adaptation*. 3. He says that humans used to spend all their time trying to find food, but now we spend our time doing what? 4. How is this an example of being adaptable? 5. How might being adaptable in the past relate to the "digital revolution" you read about last night?	

Excerpt 2 of "The Digital Revolution and the Adolescent Brain Evolution":
Text-Dependent Questions

Questions	Notes
In section 3 Dr. Giedd writes: "Having a highly **plastic brain** is particularly useful during the second decade, when the evolutionary demands of adolescence—being able to survive independently and reproduce—rely critically on the ability to adapt." 6. How might having a brain that is changing be necessary for someone to adapt? 7. Is Dr. Giedd saying that a teenager is more adaptable than an older person? Explain your thinking with evidence from the text. In section 5, Dr. Giedd explains a process you know a lot about. He is talking about myelination, synaptic branching, and pruning. He says, "The **complementary** mechanisms of overproduction/selective elimination allow the brain to specialize in response to environmental demands." 8. Why would <u>both</u> overproducing and cutting back on synapses make a brain more *adaptable*?	

Lesson 9

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=

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

Questions	Notes
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?	
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?	
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?	
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?	

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?	

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*?

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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.

Lesson 10

Vocabulary Quiz-Quiz-Trade Cards

neurological development	electrochemical impulse
neurons	neurotransmitter
prefrontal cortex	

Vocabulary Quiz-Quiz-Trade Cards

limbic system	dendrites
neural impulse	synapse
axons	myelination
myelin	synaptic pruning

Vocabulary Quiz-Quiz-Trade Cards

brain pathways	dopamine
plastic	brain plasticity
adaptable	social cognition
gray matter	neural insulation

Vocabulary Quiz-Quiz-Trade Cards

neuroscientists	complementary
socioeconomic	adaptive mechanisms

Analyzing the Main Ideas: Sam Crocker

Name:

Date:

Directions: The audio selection you will listen to today has two main ideas. As you listen, write down at least two supporting details for each main idea. You will hear it three times.

Main idea: My attention span has gotten worse.	Main idea: The social interactions on Facebook are an illusion.
Supporting details:	Supporting details:

Which main idea best relates to the reading you did last night? Why?

Excerpt 5 of "The Digital Revolution and the Adolescent Brain Evolution"

Name:

Date:

From "Digital Revolution—Social"	Gist Notes and Vocabulary
(1) The human brain is a social brain. Our ability to **gauge** the moods and intentions of others, to detect the truth or falsehood of their communications, to **discern** friend from foe, and to form alliances are among its most complex and important tasks. These skills are of premier importance to fulfill our **biological imperatives** of staying alive (through the protection of the group) and reproducing. From this perspective, it is no wonder that so much of our brains is dedicated to **social cognition** …	Gauge= Discern= Biological imperative= the thing we must do to live Social cognition=
(2) The central hub of circuitry related to social skills is the late-maturing highly plastic prefrontal cortex. Like any complex skills, **mastery** requires lots of practice. Much of the discernment relies on exquisitely subtle detection of non-verbal cues such as slight changes in eye gaze, millisecond differences in speech timing, **synchrony** of response to shared environmental **stimuli**, breathing patterns, body posture, touch, odors, etc. Might the increasing reliance on digital social interactions **hinder** exposure to the "real-world" experiences necessary to master these most important skills?	Mastery=if you have mastery in something, you are really good at it. Synchrony=occurring at the same time Stimuli= Hinder=stop or limit

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Excerpt 5 of "The Digital Revolution and the Adolescent Brain Evolution":
Text Dependent Questions

Questions	Notes
1. Dr. Giedd states, "The human brain is a social brain." He then goes on to describe four important social tasks that a person's brain must be able to do. Describe those four tasks in your own words.	
2. Dr. Giedd describes the prefrontal cortex as the "late-maturing highly plastic prefrontal cortex." What does this statement tell us about the prefrontal cortex?	
3. Referring to the social skills that a human being needs, Dr. Giedd says, "Like any complex skills, mastery requires lots of practice." How might someone practice social skills?	
4. What is a *non-verbal* cue?	
5. What is one of the non-verbal cues Dr. Giedd lists?	

Excerpt 5 of "The Digital Revolution and the Adolescent Brain Evolution":
Text Dependent Questions

Questions	Notes
6. Dr. Giedd describes the non-verbal cues as "exquisitely subtle." Which of these phrases does NOT reinforce that idea: "slight changes," "millisecond differences," or "breathing patterns"	
7. Why might these be hard to practice if you are socializing digitally?	
8. Paraphrase this question in your own words: "Might the increasing reliance on digital social interactions **hinder** exposure to the 'real-world' experiences necessary to master these most important skills?"	