

UNIT A: LESSON 1

LEARNING TARGETS

INSTRUCTIONS FOR STUDENTS:

Listen as your teacher reviews the standards and objectives. Your teacher will call on an individual or pair to explain what they mean.

Learning Target:

I can **determine** the **main** ideas and **supporting details** in the **article** “Teens and Decision Making.”

Learning Target:

I can **determine** the meaning of unknown **technical** words.

determine – decide

main – central or most important

supporting details – helping ideas

article – a short text in a newspaper or magazine

technical – having to do with specific subjects

ACQUIRING AND USING VOCABULARY

INSTRUCTIONS FOR STUDENTS:

Your teacher will pre-teach several key words. Use your glossary for the rest of the lesson to find meanings for words you don't know. Words that are **bolded** in the text and word banks can be found in the glossary. The glossary is located in the Appendix at the end of the lesson.

THINKING LOG

INSTRUCTIONS FOR STUDENTS:

Your teacher will ask you a guiding question that you will think about as your teacher reads the text aloud to you. As your teacher reads the text aloud, listen and follow along in your text. After the text has been read aloud, work with a partner to reread the text and answer the supplementary questions. Use your glossary to help you. Your teacher will review the answers with the class. You will then discuss the guiding question(s) with your teacher and the class. Finally, you will complete a written response to the guiding question(s).

GUIDING QUESTION: *Are teen brains the same as adult brains? Why or why not? Why is this information important?*

PART A: 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 about how a brain makes decisions. Decisions don't "just happen" **automatically** in 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, puts out a **response**. This output provides the basis for our **behaviors** and actions.

While this 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**.

PART A: WORD BANK

actions	developed	neurotransmitters	teens
angry	electrochemical impulses	output	thinking
automatically	imagine	problems	twenties
behaviors	instantaneously	regret	
brain	mean	response	
chemical messengers	network	series of events	
decision	neurons	similar	

PART A: SUPPLEMENTARY QUESTIONS:

1. *Look at the title. What can we learn from brain science?*

The science of the brain can help teens understand how they make a _____ (the act or result of making up one's mind).

2. *What is the author asking you in the very first paragraph?*

The author is asking me if I sometimes do things without _____. The author is asking me if this might make _____ for me.

3. *What does the author ask you to imagine, and how do you react?*

The author asks me to _____, or picture, that I am angry at a friend because the friend has sent me an email that makes me _____. I react by writing a _____ (not nice) email to my friend.

4. *What do you think "In your brain a little red light goes off" means?*

"In your brain a little red light goes off" means your brain is trying to warn you that you are about to do something _____ (good/bad).

5. *What does "You push the button" mean that you do?*

"You push the button" means that you send the mean email to your friend. You send the email even though your _____ is warning you *not* to do it.

6. *Does acting before thinking happen more often to teens or to adults?*

Making quick decisions happens more often to _____ (teens/adults).

7. *What is another way of saying "decisions made by our brains don't just happen?"*

Another way of saying “decisions made by our brains don’t just happen” is “decisions don’t happen _____.”

8. *Does just one thing happen in the brain when you make a decision?*

No, there are a _____ that happen when you make a _____.

9. *Does making a decision take a long time?*

(Yes/No) _____, your brain _____ (does/does not) take a long time to make a decision. The brain works almost _____ (at the same time).

10. *Different structures in the brain communicate, or talk with each other. How do they do this?*

Different structures in the brain communicate using specialized cells called _____. The neurons use _____ and _____ to communicate.

11. *What are the electrochemical impulses and chemical messengers called?*

Electrochemical impulses and chemical messengers are called _____.

12. *What are the structures as a whole called?*

The structures as a whole are called a _____.

13. *What does the network produce, or put out?*

The network produces a _____.

14. *What is a synonym for (another word meaning the same as) response?*

A synonym for response is _____.

15. *The output of the network in our brains is responsible for, or in charge of something. What is it responsible for?*

The network in our brains is responsible for our _____ and _____ (how we act and what we do and say).

16. *Are the brain networks of teens and adults basically similar (the same) or different?*

The brain networks of teens and adults are basically _____ (similar/different).

17. *But there is a difference between the teen and adult brain. What is the difference between the brains of teens and adults?*

The brain does not develop fully until a person is in their early _____. The teen brain is not fully _____. The adult brain is fully _____.

18. *What can happen to teens if their brains are not yet fully developed?*

If the teen brain is not yet fully developed, the teen may make _____ (good/bad) decisions that he or she may _____ (feel sorry for) later.

PART B: 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)."

PART B: WORD BANK

alcohol	emotions	plan ahead	risks
decisions	limbic system	prefrontal cortex	tobacco
developed	mature	research	twenty
drugs	peer pressure	rewards	

PART B: SUPPLEMENTARY QUESTIONS:

1. Look at the title. Why would the teen brain be considered “under construction”?

The teen brain is considered under construction because it is still developing; it is not yet _____.

2. Between the ages of 12 and 14, the brain reaches its maximum size. What does “maximum size” mean?

Maximum size means the brain is at its _____ (smallest/largest) size.

3. How long does it take for regions, or parts, of the brain to become fully developed?

It takes regions of the brain about _____ years to become fully _____.

4. How do we know that it takes this long for the brain to become fully developed?

We know this because scientists _____, or study, the brain.

5. What is the name of the region of the brain that matures later than other regions?

The region of the brain that matures later is called the _____.

6. How does the author compare the prefrontal cortex with the little red light we read about before?

The prefrontal cortex helps us think ahead so we are able to recognize _____ and _____. It is just like the little red light that warned us about sending a mean e-mail.

7. What region of the brain matures earlier than other regions?

The region of the brain that matures earlier is the _____.

8. What is the limbic system involved with?

The limbic system is involved with our _____.

9. When teens are making decision, which do they use more: the prefrontal cortex or the limbic system?

Teens use the _____ (prefrontal cortex/limbic system) more for making _____.

10. When teens are in emotional situations, which do they use more: the prefrontal cortex or the limbic system?

Teens use the _____(prefrontal cortex/limbic system) more in emotional situations.

11. Does this mean that the teens' choices are more emotional or less emotional?

Teens' choices are _____(more/less) emotional.

12. If the teens' prefrontal cortex were more mature, would their choices be more logical or less logical (would their choices make more sense or less sense)?

Their choices would be _____(more/less) logical if the prefrontal cortex was more mature.

13. Does the author consider choices made by feelings (emotions) more or less healthy than choices made by logic? How do you know?

The author considers emotional choices _____(more/less) healthy than choices made by logic. We know this because in the last paragraph he writes, "this is also why teens are more likely to make " _____" (good/bad) choices, such as _____, _____, and _____, all of which pose a risk of serious health consequences."

14. Does Professor Steinberg think teens plan to use drugs?

_____ (Yes, he does./No, he doesn't).

15. Professor Steinberg think teens probably experiment "on the spur of the moment." What does "on the spur of the moment" mean?

"On the spur of the moment" means that teens probably don't _____to use drugs. They use drugs, alcohol, and tobacco when it is front of them.

16. The professor also believes teens experiment when they are influenced by others. What is "being influenced by other people in your own age group" called?

Being influenced by others in your own age group is called _____.

RESPONSE TO GUIDING QUESTION(S):

Are teen brains the same as adult brains? Why or why not? Why is this information important?

Response:

NEUROLOGIST NOTEBOOK

INSTRUCTIONS FOR STUDENTS:

Work with a partner. Use your neurologist notebook to write down key, or important, information from the text. You will write down main ideas and some details, or specific information, about each main idea. You can use information from your Thinking Log. Some information is already filled in for you.

WORD BANK:

adult, adults, electrochemical impulses, emotional, feelings, limbic system, logic, neurons, prefrontal cortex, rewards, risks, teen, teens, think

Introduction:

_____ brains are different from _____ brains. We can use science to understand why. Science can help us understand why _____ make decisions differently than _____.

Brief background:

Special brain cells called _____ use _____ _____ to talk to each other. This communication is happening in different parts of the brain.

Main idea:

One part of the brain that matures late is the _____.

Supporting details:

The _____ helps you _____ ahead and figure out _____ and _____. It is the brain's _____ center.

Main idea:

The _____ matures early, so teens are more likely to use it to make decisions.

Supporting details:

The _____ plays a central role in _____ responses. It is the brain's _____ center.

Conclusion:

Teens are more likely to make decisions based on _____ instead of _____.

FUNCTIONAL ANALYSIS

INSTRUCTIONS FOR STUDENTS:

Work with your class to analyze an important sentence(s) from the text.

- Every sentence has someone or something that *does* something. First you determine this *who or what*.
- Every sentence has something that they *do or did*. Figure that part out next. Now you have the most important parts of the sentence in place.
- Then you will figure out what they did the action *to or for*.
- Finally, you will write the descriptive details.
- Write your answers in the spaces below.
- When you are done, write the sentence again in your own words.

You may want to use definitions from the glossed text in the sections above.

Functional Analysis:

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.

WHO OR WHAT (Actor): *the* _____

DESCRIPTOR (Detail): *in which a teen's decision-making circuit integrates information*

WHAT HAPPENED (Action): *may* _____

WHO (Recipient): _____ *or* _____

DESCRIPTOR (Detail): *at a higher* _____

DESCRIPTOR (Detail): *of making decisions the teen could later regret*

WHY: *since* _____

What the sentence says:	My own words:
The way in which a teen's decision-making circuit integrates	The way a teen's _____ makes _____
may put	can put
him or her	the teen
at a higher risk	at _____ risk
of making decisions the teen could later regret	of _____ _____
Since the brain is not fully developed until the early 20s	since the brain is not _____ until _____

Write the sentence in your own words and then explain it to your partner.

EXIT TICKET

INSTRUCTIONS FOR STUDENTS:

This graphic organizer will help you keep track of information about the brain for all of the readings. Each day you will write down new information from each reading.

- First, write information about how the whole brain matures, or develops as you get older.
- Next, provide, or write, information you are learning about each of the brain's parts: the prefrontal cortex, the neurons, and the limbic system.
- Then write what you learned about teen decision making (*so what?*).

WORD BANK:

brain, emotions, logic, neurotransmitters, twenties

Information about how the brain develops	Prefrontal cortex	Neurons	Limbic system	So what?
Your brain does not fully develop until your _____.	Processes decisions using _____. Matures _____. (late/early)	Specialized cells in your _____. "Talk" to each other with _____.	Processes decisions using _____. Matures _____. (late/early)	<i>[Write what you learned about teen decision-making:]</i>

Appendix: Glossary

Word	Definition	Example
adult (adults)	a grown-up person	While this is basically the same for teens and adults , the devil is in the details.
automatic (automatically)	something that happens by itself	Decisions don't "just happen" automatically .
behavior	how we act	This output from the brain provides the basis for our behaviors and actions.
chemical	a substance in the body that reacts to other substances	Neurons talk with each other by way of chemical messengers called neurotransmitters.
consequence	something that happens because of something else	Drugs, alcohol, and tobacco have a risk of serious health consequences .
control	to influence or direct people's actions.	The prefrontal cortex is very important as a control center for thinking ahead and sizing up risks and rewards .
construction	being built	The teen brain is under construction .
decision (decision-making)	choice or determination	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.
developed	mature; grown	The brain is not fully developed until the early 20s.
electrochemical impulse	a signal, or message, in the body that is both electric and chemical	Neurons talk with each other by way of electrochemical impulses and chemical messengers.

Word	Definition	Example
emotion (emotional, emotionally)	a strong feeling	The limbic system plays a central role in emotional responses.
instantaneously	at the same time	Decisions come from a series of events in the brain that happen almost instantaneously .
integrate	bring several things together and blend, or mix them into a whole	The way a teen's decision-making circuit integrates information may put him or her at a higher risk of making bad decisions.
key	important	A key brain region that matures late is the prefrontal cortex.
limbic system	the part of the brain that processes, or deals with, emotions	A part of the brain that matures earlier is the limbic system , which plays a central role in emotional responses.
logic	thinking or reasoning	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).
mature	develop or grow older	Regions of the brain continue to mature all the way through a person's early 20s.
maximum	largest possible	The brain reaches its maximum size between ages 12 and 14.
network	system, or group of parts, that is connected	All of the parts of the brain network , as a whole, put out a response.

Word	Definition	Example
neuron	specialized cell in the brain	Specialized brain cells called neurons talk with each other by way of neurotransmitters.
neurotransmitter	chemical messenger that helps carry signals in the brain	Neurons talk with each other by way of neurotransmitters .
prefrontal cortex	a region of the brain that is important for logic and thinking ahead	The prefrontal cortex , which is directly behind your forehead, matures later.
region	an area of the body	Regions of the brain continue to mature all the way through a person's early 20s.
regret	feel sad or sorry about something you have done	Teens may be at a higher risk of making decisions they later regret .
relay system	a group of related parts that work one after another to complete, or finish, a task	Decision making involves a relay system in which different brain structures talk with each other.
research	studying and collecting information about something	Research shows that the brain reaches its maximum size between ages 12 and 14, but it is not yet mature.
response	a reaction to something	The brain puts out a response .
reward	a thing you receive because you did something good	The prefrontal cortex is very important for sizing up risks and rewards .
risk	something that may be unsafe	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.

Word	Definition	Example
role	function; the part that something plays in a larger system or action	The limbic system plays a central role in emotional responses.
rush	hurry	Rushed decisions like this—acting before thinking it through—happen more often in teens than in adults.
series of events	a group of related things taking place one after another	Decisions come from a series of events in the brain that happen almost instantaneously.
structure	the way parts of something are joined together	The brain studies and decides about information in its different structures .
teen (teens)	13--19 year olds	While this is basically the same for teens and adults, the devil is in the details.