

ELEMENTARY
AND MIDDLE
SCHOOL

TOPIC SERIES ACTIVITY

Marijuana



ACTIVITY OVERVIEW



Marijuana

Overview

During this activity, students will build their understanding of how marijuana impacts the adolescent brain and body. Students will view the DEA Operation Prevention video on Marijuana and then use activity cards to investigate the impact delta-9-tetrahydrocannabinol (THC) has on the different parts of the brain. After reading their cards, students will work in groups to align the impact on the brain and the body.

Modifications

Please note that all activities can be adjusted to accommodate both a face to face and a virtual learning experience.

Grade Level

Grades 3–8

Activity Duration

30–45 minutes

Objectives

Students will:

- Analyze the impact of marijuana by using information text to chart how THC affects the brain.
- Create their own questions about the impact of marijuana on the brain and the body to drive engagement

Materials

- Operation Prevention: Marijuana Topic Series Video
- *Marijuana: See, Think, Wonder Image (Middle and Elementary School Version)*
- *Marijuana and the Brain Handout (Middle and Elementary School Version)*
- *Marijuana and the Brain Impact Cards Handout (Middle and Elementary School Version)*

HEALTH STANDARDS

Standards

ELA Common Core State Standards

- W.5.2.D Use precise language and domain-specific vocabulary to inform about or explain the topic.
- W.5.4: Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.
- SL.5.1: Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.

National Health Standards

- 1.8.1 Analyze the relationship between healthy behaviors and personal health
- 5.5.6 Describe the outcomes of a health-related decision
- 8.5.1 Express opinions and give accurate information about health issues

ENGAGE

- Begin the class by explaining to students that they are going to be learning more about the use of marijuana in adolescents and the impact the drug has on the brain and the body.
 - Project the image *Marijuana: See, Think, Wonder* Image on the board, or print and position the image on a large sheet of chart paper on tables around room. Have markers available. Decide if you wish to assign students to groups or allow them to move freely around the room.
 - Invite students to take a few moments to view the image and consider their reactions to the image. Explain that students will record the ideas and questions on the chart paper using their markers. Encourage students to read and to add to each other's responses with additional comments and questions that may further the discussion.
- NOTE:** for younger students it may be helpful to model the Chalk Talk rotation.
- Provide time for students to circulate around the Chalk Talk paper, reading and adding to the prompts and responses as they build up. If working in groups, you may want them to stay

with one recording sheet for five minutes to allow the conversation to develop. Groups can then rotate to another group's paper, silently reading what is written there, and adding their reactions and questions to the paper.

- The teacher may need to prompt the group about the types of responses they can make as they read: connecting ideas, elaborating on others' ideas, commenting on what others have written, asking others to respond with more detail, and so on.
- If people have rotated as a group, allow them to return to their original starting places to read what others have written on "their" Chalk Talk paper. Ask the group:
 - what themes do you notice?
 - what are common issues and reactions?
 - what questions surprised you?
- Debrief the process itself, asking the group how their thinking developed during the Chalk Talk process. Note: this time may vary based on age group

INVESTIGATE AND VIEW

- After students have developed an initial understanding of marijuana's impact, inform them that they are about to watch a short video
- Play the DEA Operation Prevention marijuana video for students.
- After watching the video, ask students to briefly write down what they remember about marijuana's impact on the brain and the body from the video. You may choose to show the video for a second time if needed.

- As students finish writing, instruct them to share a few thoughts with their neighbor. Invite students to also share what they know with the class. This will be a good time to invite students to share questions they may have.

APPLY

- To apply what students have learned, they will now dig deeper into the impact of marijuana on the adolescent brain.
 - Distribute copies of the *Marijuana and the Brain* handout to students. Invite students to take a few minutes to read through the short excerpt. Instruct students to highlight or underline two important things they learned about the brain from the reading.
 - Next, explain to students that they are going to be learning about specific parts of the brain and the impact marijuana has on each area by using the *Marijuana and the Brain* Impact Cards
 - Take a moment to project an image of the brain on the board and explain that students are going to be working in groups of two to three to understand the impact of THC on the brain. Using their *Marijuana and the Brain* Impact Cards, direct students to correctly label their map with each impacted part of the brain. Next, invite students to share with each other how their card (part of the brain) is impacted by THC.
- NOTE:** for younger students, you may choose to have the brain labeled before distributing to students.
- During this time it may be helpful to move around the room to help clarify any misconceptions students may have. As students finish, provide them the opportunity to share new ideas or questions that have presented themselves.



MARIJUANA USE & EDUCATIONAL OUTCOMES

Studies show that marijuana interferes with attention, motivation, memory, and learning. Students who use marijuana regularly tend to get lower grades and are more likely to drop out of high school than those who don't use. Those who use it regularly may be functioning at a reduced intellectual level most or all of the time.

MOST MARIJUANA USE BEGINS IN ADOLESCENCE



78%

of the 2.4 million people who began using in the last year were aged 12 to 20.¹

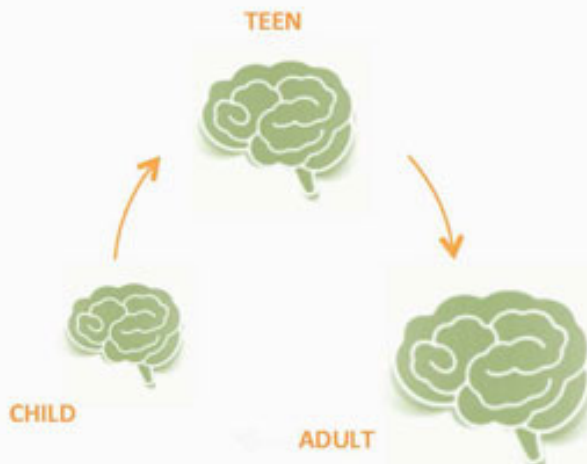
As perception of harm decreases...



EVERY DAY, **3,287 TEENS** USE MARIJUANA FOR THE FIRST TIME¹

MARIJUANA MAY HURT THE DEVELOPING TEEN BRAIN

The teen brain is **still developing** and it is especially vulnerable to drug use.

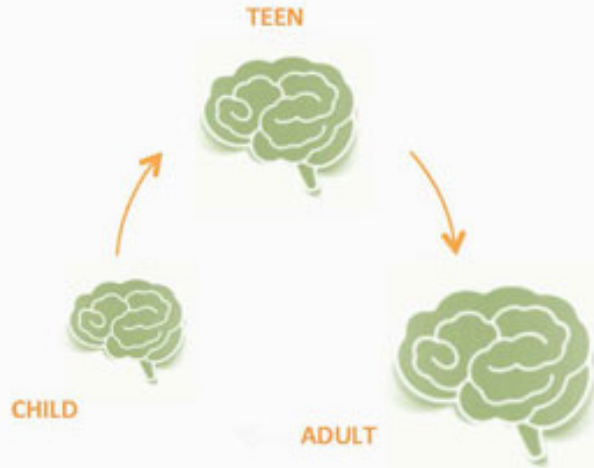


IQ

Regular heavy marijuana use by teens can lead to an IQ drop of up to **8 points**³

MARIJUANA MAY HURT THE DEVELOPING TEEN BRAIN

The teen brain is **still developing** and it is especially vulnerable to drug use.



IQ

Regular heavy marijuana use by teens can lead to an IQ drop of up to **8 points³**

MARIJUANA AND THE BRAIN

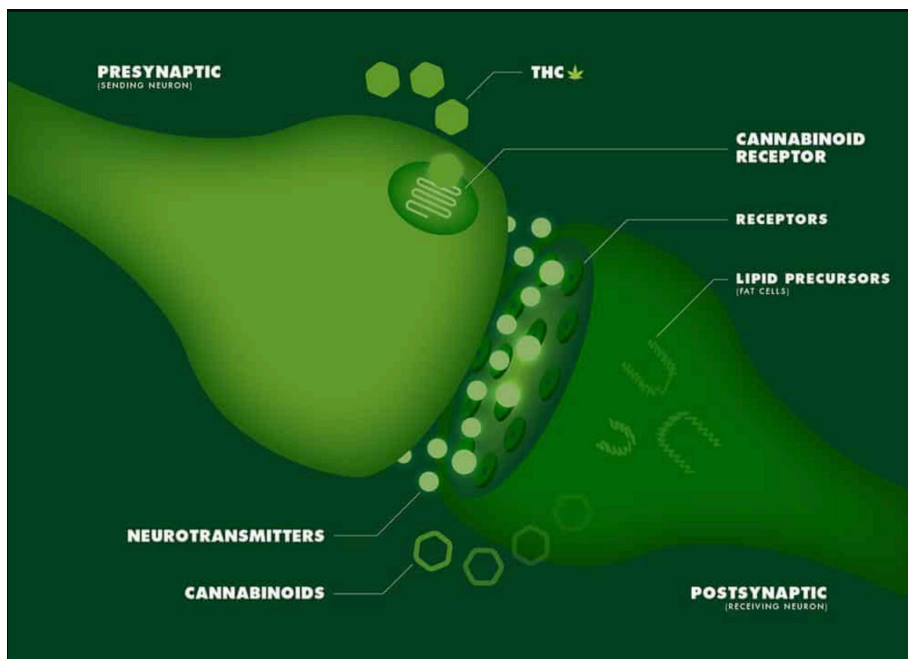
MIDDLE
SCHOOL
HANDOUT

The endocannabinoid (EC) system, named after the marijuana plant *Cannabis sativa* and its active ingredient delta-9-tetrahydrocannabinol (THC), is a communication system in the brain and body that affects many important functions, including how a person feels, moves, and reacts.

Natural chemicals produced by the body that interact within the endocannabinoid system are called cannabinoids, and, like THC, they interact with receptors to regulate these important body functions.

When a person smokes marijuana, THC overwhelms the EC system, quickly attaching to cannabinoid receptors throughout the brain and body. This interferes with the ability of natural cannabinoids to do their job of fine-tuning communication between neurons, which can throw the entire system off-balance.

Because cannabinoid receptors are in so many parts of the brain and body, the effects of THC are wide-ranging.



<https://teens.drugabuse.gov/drug-facts/marijuana>

MARIJUANA AND THE BRAIN

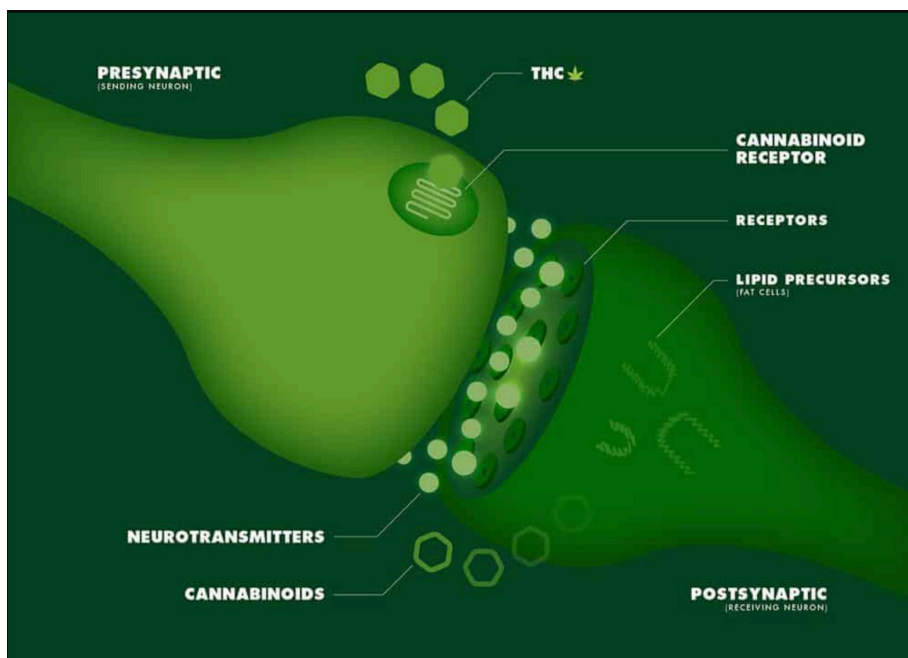
ELEMENTARY
SCHOOL
HANDOUT

Scientists know that marijuana can be harmful when it enters the body, there is even more risk for adolescents or young people. Marijuana can negatively impact how you play sports, learn in school, and even when you interact with your friends or family.

The reason for this is what happens when marijuana enters the brain. Scientists have discovered the place where marijuana acts in the

brain called cannabinoid receptors or CB receptors. These sites make up something called the endocannabinoid system or EC system. This system is found all over the brain.

Marijuana or THC attaches itself to the CB receptors and gets sent all over the EC system, this explains why so many parts of your brain are changed when THC enters the body. These changes can lead to dangerous and harmful side effects.

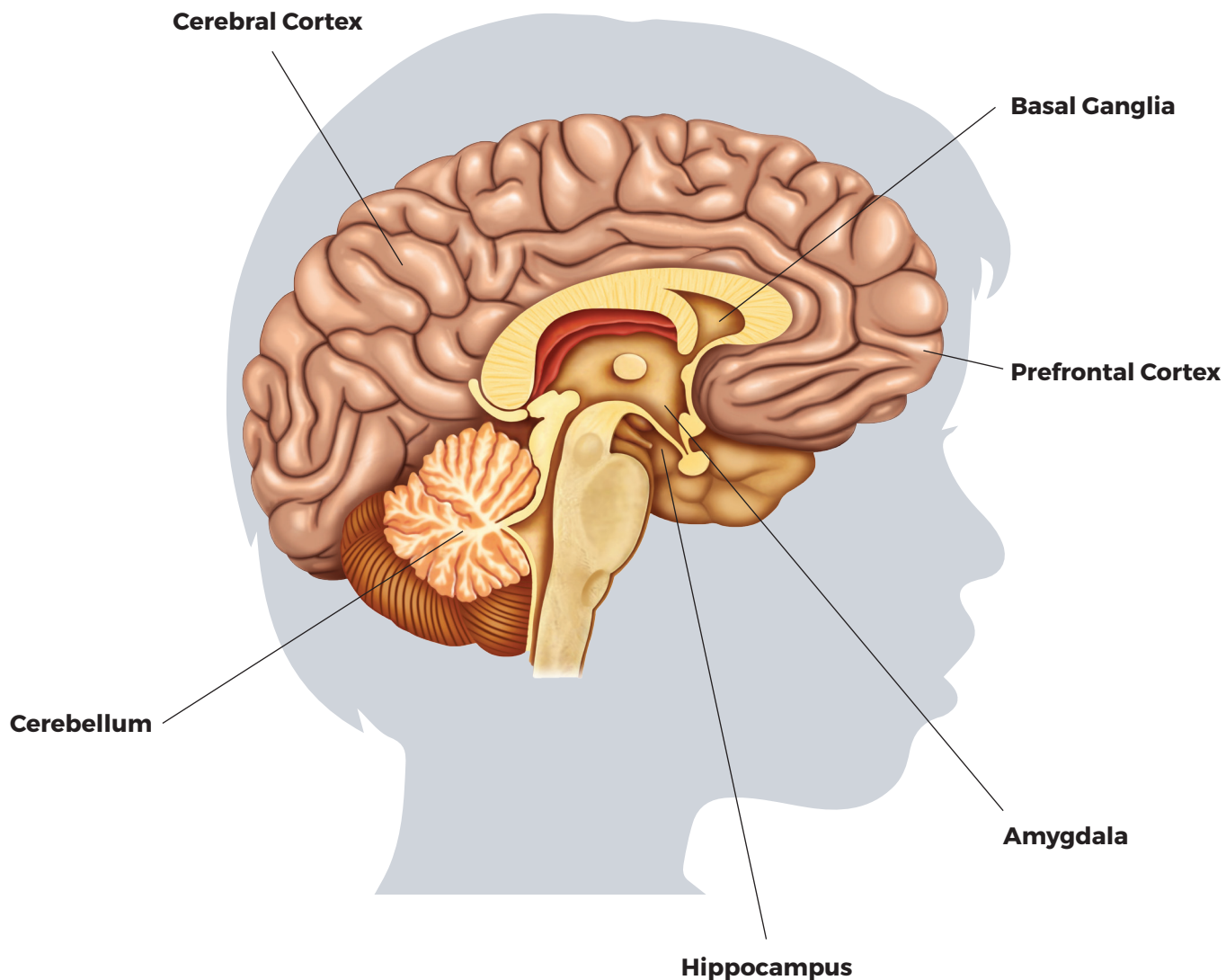


<https://teens.drugabuse.gov/drug-facts/marijuana>

MARIJUANA AND THE BRAIN

ELEMENTARY
SCHOOL
HANDOUT

IMPACT CARDS PART 1



IMPACT CARDS PART 2

Cerebral Cortex

Role: Controls memory, thinking, and perception.

Impact of THC: THC has a big impact on the Cerebral Cortex. When THC enters the body, it can create changes in the way people perceive reality and can cause people to forget.

Basal Ganglia

Role: Plays an important role in experiencing positive forms of motivation.

Impact of THC: The Basal Ganglia create something called the "reward circuit". Drugs like marijuana create an overactive circuit and overwhelm the brain.

Hippocampus

Role: Controls memory storage and ability to recall information.

Impact of THC: THC can make it hard to process information and may make it hard to remember things you just learned.

Amygdala

Role: Manages emotions and feelings like irritability, anxiety, and stress.

Impact of THC: THC makes the amygdala very sensitive and lots of drug use can trick the amygdala into feeling happiness.

Prefrontal Cortex

Role: The Prefrontal Cortex helps the brain think, plan, and solve problems. This is the last part of the brain to develop and makes it very vulnerable in young people.

Impact of THC: THC changes the balance in the brain to shift the feelings of rewarding sensations.

Cerebellum

Role: This part of the brain helps control muscles, coordination, and movement

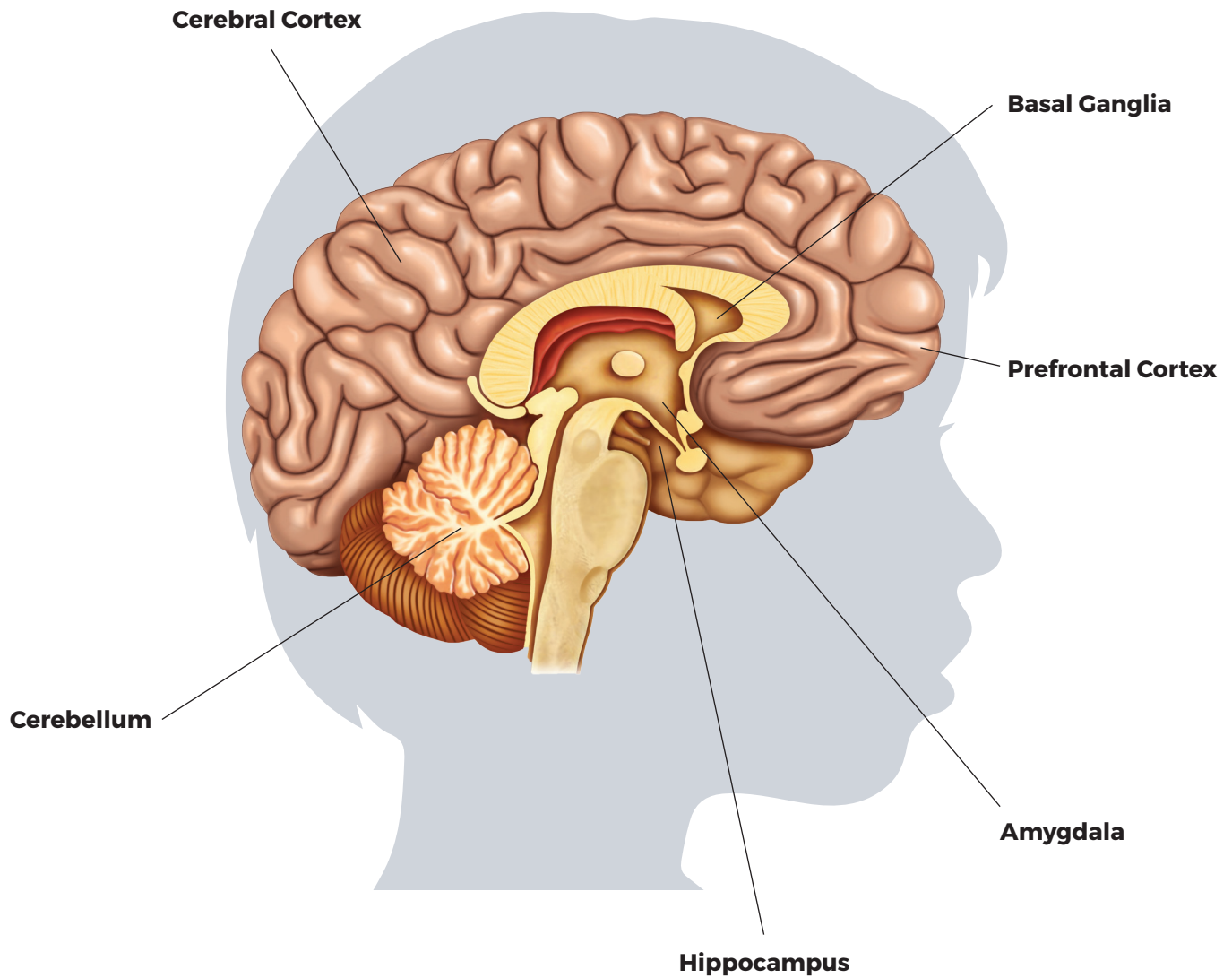
Impact of THC: THC can impact coordination and sense of time and speed.

<https://www.drugabuse.gov/publications/drugs-brains-behavior-science-addiction/drugs-brain>

MARIJUANA AND THE BRAIN

MIDDLE
SCHOOL
HANDOUT

IMPACT CARDS PART 1



IMPACT CARDS PART 2

Cerebral Cortex

Role: Controls memory, thinking, and perception

Impact of THC: THC has a large impact on the Cerebral Cortex. When THC enters the body, it can create perceptual distortion, altered consciousness, memory impairment, and delusions.

Basal Ganglia

Role: Plays an important role in positive forms of motivation, including pleasurable effects of healthy activities like eating and socializing.

Impact of THC: These areas create something called the “reward circuit”. Drugs create an overactive circuit and, with repeated use, can reduce sensitivity and make it hard to gain pleasure from anything but the drug.

Hippocampus

Role: Controls memory storage and ability to recall.

Impact of THC: THC can cause difficulties in processing information and may make it hard to remember things that happened recently, or learn new information. Judgment and decision-making also can be affected in a negative way.

Amygdala

Role: Manages emotions and feelings like irritability, anxiety, and stress.

Impact of THC: THC makes the amygdala increasingly sensitive with increased drug use, and over time, a person with addiction might use drugs not to get high, but simply to get temporary relief from this discomfort.

Prefrontal Cortex

Role: Powers the brain’s ability to think, plan, solve problems, make decisions, and exert self-control over emotions. This is the last part of the brain to develop and makes it very vulnerable in adolescents.

Impact of THC: THC shifts the balance between the prefrontal cortex and the reward and stress circuits of the basal ganglia to reduce impulse control.

Cerebellum

Role: This part of the brain helps regulate muscle control, coordination, and movement.

Impact of THC: Since marijuana can affect coordination and the perception of time and speed, a person’s performance in everything from playing sports to driving may suffer.

<https://www.drugabuse.gov/publications/drugs-brains-behavior-science-addiction/drugs-brain>