

Introduction

Educators play a critical role in supporting kids as they learn to make healthy choices and smart decisions.

Ask, Listen, Learn's "How Alcohol Affects the Brain" videos and corresponding classroom lessons have been designed to teach kids about the physical impact underage drinking has on the developing brain and body, providing educators with versatile classroom resources to facilitate conversations about underage drinking with students, while teaching them about the scientific effects of what they put in their alcohol on still developing bodies.

The newest addition to the program includes a unit on how marijuana affects a teen's developing brain and body. This content may seem unfamiliar, and we've heard from teachers and counselors across the country that they don't have the resources they need to teach their students about marijuana.

Ask, Listen, Learn approaches prevention education from a scientific perspective to share the facts with kids in an engaging way. Our focus on the developing brain is at the core of our curriculum; when adding this unit on marijuana, we wanted to maintain the same focus, which led to learning about how marijuana impacts the endocannabinoid system.

So - before you get started in the classroom, please review the following primer with information on:

- **The endocannabinoid system - what it is, how it works, and why it's important for your students to learn about**
- **The marijuana plant - its different parts and properties (THC vs CBD)**
- **A note legalization and medical marijuana**

The Endocannabinoid System

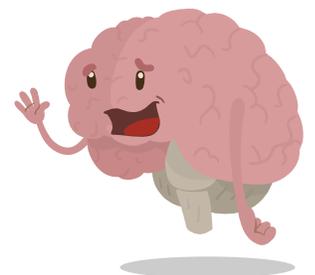
The endocannabinoid system is a biological system in the brain consisting three parts:

- Endocannabinoids
- Cellular receptors
- Enzymes

While scientists knew that THC affected the brain, the endocannabinoid system wasn't discovered until the early 1990s when scientists identified receptors in the brain that THC would bind to - Cannabinoid Receptor 1 or CB1 (on brain cells) and Cannabinoid Receptor 2 or CB2 (on immune tissue and immune cells). The endocannabinoid system was thus named after the plant THC comes from, marijuana.

Later, scientists found that the brain makes its own chemicals that bind to these receptors. These chemicals, called endocannabinoids, are released by brain cells receiving messages from other cells. The endocannabinoids serve as an "off switch" to tell cells that the message has been received. This transmission of feedback to the cells makes endocannabinoids a key piece in regulating brain functions.

Endocannabinoids are eventually broken down by enzymes - together, this system creates balance in the brain and influences many functions, including motor control, memory, emotions, and more.



For your next class...

To learn more about teaching units on the impacts of underage drinking and peer pressure, see additional lessons from *Ask, Listen, Learn*

Marijuana

Marijuana is a plant that has been harvested for thousands of years - the plant has exudes a sticky resin that contains many natural chemicals. Two of the main ones are THC and CBD. Cannabis and marijuana are often used interchangeably - in the *Ask, Listen, Learn* program, we use the word marijuana for student-facing content, as our formative research taught us that was the verbiage students aged 9 - 13 are most familiar with.

- THC (Delta-9-tetrahydrocannabinol)
 - o Psychoactive
 - o Binds to CB1 receptors and doesn't get broken down by enzymes like an endocannabinoid would
 - o FDA approved in very select medical scenarios related to HIV and chemotherapy induced nausea
- CBD (Cannabidiol)
 - o Non-psychoactive
 - o Blocks CB1 receptors
 - o Not intoxicating or addictive
 - o FDA approved for use in two subtypes of seizures
 - o No specific age limit for use but most retailers will not sell to persons under 18



THC is the substance that makes people “high” from marijuana use, and it can be used in many forms:

- Marijuana plant
 - o Leaves, stems, and flowering buds of the plant can be dried and smoked
- Edibles
 - o Multiple varied forms of baked goods, candies, and beverages that can look like regular foods.
- Vaping liquid
 - o THC solution is vaporized by wicking it up and exposing to heat source
 - o Does not produce smoke, but produces vapor
- Marijuana concentrates
 - o Concentrates are extracted from the marijuana plant, making them more potent than the plant itself. Common concentrates include hash, rosin, resin, tinctures, and more

Legalization and Medicinal Use

Recreational marijuana is legal in 11 states and the District of Columbia for adults over the age of 21, legal for medicinal use in 33 states, and still federally illegal. The landscape of marijuana legalization is constantly changing. **The crucial, general message is that marijuana use for anyone under the age of 21 is illegal and potentially harmful to the developing brain and body.**

There are some extreme exceptions for youth use marijuana products (virtually always a CBD preparation, and not THC) in the case of serious medical conditions. **When teaching this content, please make it clear that marijuana is sometimes used as a medicine in specific instances so as not to isolate a child who may be living with those circumstances.**

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