

# Nicotine Addiction: Breaking Up With My Vape

## Teacher Information



..... just add students™

### Summary

Follow the story of a teen who is trying to quit vaping. Model how vaping nicotine affects the receptors and dopamine levels in the brain reward pathway. Use the model to understand nicotine tolerance, dependence, addiction, withdrawal, and recovery from nicotine addiction.

### Core Concepts

- Most e-cigarette liquids contain nicotine, a drug that changes the way that neurons in the brain communicate.
- Nicotine interacts with cell membrane receptors and neurotransmitters that are involved in cell communication and homeostasis maintenance.
- Nicotine's interaction with the brain reward pathway causes pleasure. This motivates some people to use nicotine repeatedly, despite risks to their health and well-being.
- It is difficult, but not impossible, to quit vaping. A vaping quitting plan can increase a person's chances of quitting successfully.

### Time Required

- 1–2 forty-minute class periods to complete Parts 1 through 4.
- 1–2 forty-minute class period to complete Part 5 and allow for sharing of vaping quitting plans.

### Kit Contains

- **Nicotine and the Brain** reading sheet
- **Brain Reward Pathway** model sheet
- 3 Green plugs (acetylcholine)
- 6 Red plugs (nicotine)
- 6 Yellow cups (receptors)
- 4 Blue beads (dopamine)
- 1 Happy face token
- 1 Sad face token

### Teacher Provides

- Access to internet for Part 5

### Warning: Choking Hazard

This Science Take-Out kit contains small parts. Do not allow children under the age of seven to have access to any kit components.

## Suggestions for Teachers

- The purpose of this kit is to make students aware that use of nicotine in e-cigarettes causes changes in the brain and may lead to nicotine addiction.
- The kit is designed to encourage discussions and questions related to nicotine addiction. Encourage students to discuss their opinions, questions, and concerns.
- Be aware that your students may already use e-cigarettes. They may have friends or family members who use e-cigarettes.
- Teens associate nicotine addiction with smoking. The science of nicotine addiction has been studied extensively in smokers. This kit is designed to help students understand that vaping nicotine can also lead to addiction.
- If you would like to know more about e-cigarettes and vaping before you use this kit with your students, the **Teacher Background Information** section below provides background information.
- Teachers should be prepared to provide information on specific support services in their school and community that are available to help students who want to quit vaping. Show this kit to people who provide these services before you use the kits with your students.
- Collaboration among counselors, health teachers, and science teachers is likely to increase the effectiveness of this kit.

### Part 1 – 3 Suggestions:

- Students can work on the kit individually or with a partner. Each kit includes one copy of the student instructions and the **Nicotine and the Brain** reading sheet. Make additional copies as needed if students are sharing a kit.
- Students will need the **Nicotine and the Brain** reading sheet, the **Brain Reward Pathway** sheet and the model pieces (green plugs, red plugs, yellow cups, blue beads, and face tokens). If you are using the kit in multiple classes, consider laminating the reading sheets or putting them in sheet protectors.
- Consider having students take photos of their models. They could use these photos to teach other students how nicotine use changes the brain.
- Students do not need prior instruction on nervous system structure and function. This kit has been successfully used in health classes and in community outreach programs.
- Some students may struggle with question 4 in Part 2. It may be helpful to have students discuss their answers to this question before they write.

- As a hook, consider showing all or part of this video, **Youth E-Cigarette Addiction: In Their Own Words** (4 min.) – <https://www.youtube.com/watch?v=fuUNLU3pI54&feature=youtu.be>

#### Part 4 Suggestions:

- The following videos could be used for review of Part 4 or to introduce Part 4. Both videos refer to smoking, not vaping. Remind students that both cigarettes and e-cigarettes contain nicotine.
  - **Nicotine addiction explained** (3 min.) – <https://www.quit.org.au/articles/nicotine-addiction-explained/>
  - **What is nicotine withdrawal?** (3 min.) – <https://www.quit.org.au/articles/what-is-nicotine-withdrawal/>
- For Advanced Placement or college classes, consider providing access to this research paper at the end of Part 4.
  - **Nicotine and the adolescent brain** – <https://physoc.onlinelibrary.wiley.com/doi/full/10.1113/JP270492>

Note: Two questions that students may ask could be simplistically answered as shown below.

- **Why does the brain have nicotine receptors?** These particular receptors, called nicotinic acetylcholine receptors, are normally activated by the body's own acetylcholine, one of many natural chemical messengers that transmit information in the nervous system. Because nicotine mimics the shape of acetylcholine, it can fit into these receptors in the brain, taking over the role acetylcholine typically fills.
- **Can the brain release dopamine if nicotine is not present?** Yes! Usually, a chemical messenger called acetylcholine binds to the receptors and triggers the natural release of dopamine. There are many things you can do to increase your dopamine levels naturally. Things like meditation, exercise, and listening to music can boost dopamine levels. For more information, see <https://www.healthline.com/nutrition/how-to-increase-dopamine>.

#### Part 5 Suggestions:

- Explain that both smoking and vaping expose people to nicotine. <https://www.drugabuse.gov/news-events/science-highlight/study-shows-e-cigarettes-affect-brain-similarly-to-other-nicotine-sources> Therefore, it is OK to use information on quitting cigarettes and other forms of tobacco for Part 5.
- Students should work individually or with a partner to complete Part 5.
- Provide opportunities for students to share answers. This could be done by dividing the class into three teams. Each team is assigned to write their ideas on one of three class posters. Posters should be labeled “Why Quit—questions 1–2,” “Make Quitting Easier—

question 3,” and “Increase Dopamine Naturally—question 4.” Then, each team moves to a new poster and adds new ideas.

- Optional extension activity: “Help people quit successfully! Use your lists to create media with tips to help people quit vaping. You could create a poster, a brochure, Google slides, a video, a song, a cartoon or other creative media.” *Note to teacher: Because no creative media could contain all of the ideas on the posters, students might volunteer to focus on several ideas. They could write their name or initials on the class posters to indicate with ideas their creative media will cover.* This extension activity could be expanded to include work in school and community programs.

## Teacher Background Information

- **CDC – Quick Facts on the Risks of E-cigarettes for Kids, Teens, and Young Adults**  
[https://www.cdc.gov/tobacco/basic\\_information/e-cigarettes/Quick-Facts-on-the-Risks-of-E-cigarettes-for-Kids-Teens-and-Young-Adults.html](https://www.cdc.gov/tobacco/basic_information/e-cigarettes/Quick-Facts-on-the-Risks-of-E-cigarettes-for-Kids-Teens-and-Young-Adults.html)
- **Think E-Cigs Can’t Harm Teens’ Health?** <https://www.fda.gov/tobacco-products/public-health-education/think-e-cigs-cant-harm-teens-health>
- **Vaping Addiction and Nicotine Withdrawal** <https://teen.smokefree.gov/quit-vaping/vaping-addiction-nicotine-withdrawal>
- **Vaping Devices (Electronic Cigarettes) DrugFacts**  
<https://www.drugabuse.gov/publications/drugfacts/vaping-devices-electronic-cigarettes>
- **Nicotine Addiction** <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2928221/>
- **5 Vaping Facts You Need to Know** [www.hopkinsmedicine.org/health/wellness-and-prevention/5-truths-you-need-to-know-about-vaping](http://www.hopkinsmedicine.org/health/wellness-and-prevention/5-truths-you-need-to-know-about-vaping)
- **The Science of Addiction: Genetics and the Brain**  
<https://learn.genetics.utah.edu/content/addiction/>
- **Explainer: The Nico-Teen Brain** <https://www.sciencenewsforstudents.org/article/explainer-nico-teen-brain>
- **Explainer: Dopamine** <https://www.sciencenewsforstudents.org/article/explainer-what-dopamine>

## Related Science Take-Out Kits

Science Take-Out offers four vaping education kits, each with a different perspective on the hazards associated with vaping.

- **Does Vaping Expose You to Toxic Chemicals?** (STO-165)  
Use of e-cigarettes exposes people to chemical substances known to increase risks of respiratory system damage.
- **Are Flavored E-Cigarettes Harmful?** (STO-166)  
Vaping flavoring chemicals may cause short and long-term damage to the respiratory system.
- **Nicotine Addiction: Breaking Up With My Vape** (STO-167)  
Use models to show how nicotine changes the brain during tolerance, dependence, addiction, and quitting.
- **Nicotine Poisoning** (STO-168)  
The nicotine in e-liquids and e-cigarettes is a dangerous toxin—particularly for young children. E-liquid product flavoring and packaging may appeal to young children and may lead to nicotine poisoning.

The following Science Take-Out kits are also related to the **Nicotine Addiction: Breaking Up With My Vape** kit:

- **Cell Communication** (STO-133)  
Model how cells send, receive, and respond to stimuli.
- **Brain Reward Pathway and Addiction** (STO-131)  
Understand how the brain reward pathway results in repetitive drug using behavior.
- **Keeping the Balance: Homeostasis and Negative Feedback** (STO-121)  
Use a hands-on simulation to show how “Cupples” maintain homeostasis. Explore how negative feedback maintains blood sugar levels.

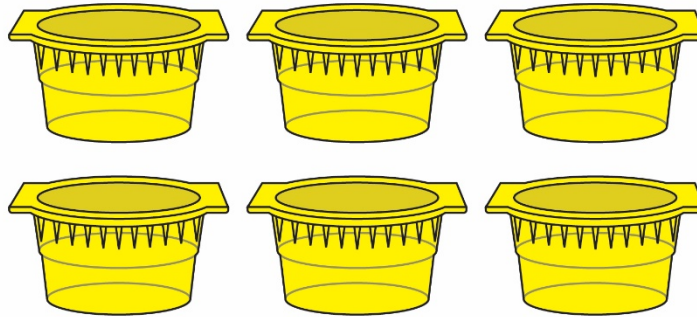
## Reusing the Kit

Teachers will need to instruct students on how to handle cleanup and return of the reusable kit materials. For example, teachers might provide the following information for students:

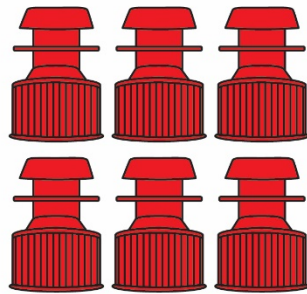
| Discard | Return to kit bag                                                                                                                                                                                                                                                                                                                                                |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Nothing | <ul style="list-style-type: none"><li>• <b>Nicotine and the Brain</b> reading sheet</li><li>• <b>Brain Reward Pathway</b> illustration</li><li>• 3 Green plugs (acetylcholine)</li><li>• 6 Red plugs (nicotine)</li><li>• 6 Yellow cups (nicotine receptors)</li><li>• 4 Blue beads (dopamine)</li><li>• 1 Happy face token</li><li>• 1 Sad face token</li></ul> |

Tip: Consider laminating the **Nicotine and the Brain** reading sheet and the **Brain Reward Pathway** illustration. *You could use a sheet protector instead of lamination.*

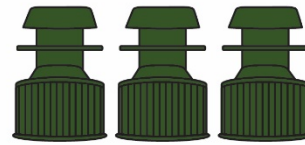
# Kit Contents Quick Guide



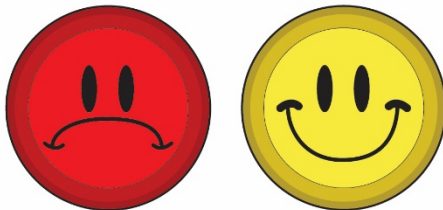
Yellow Cups  
(Receptors)



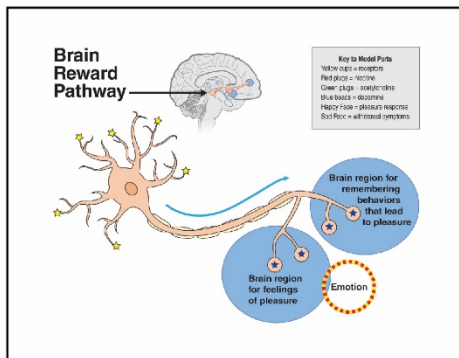
Red Plugs  
(Nicotine)



Green Plugs  
(Acetylcholine)



Blue Beads  
(Dopamine)



**Nicotine and the Brain**

**Natural Rewards and the Brain Reward Pathway**  
The brain is "wired" to repeat behaviors that lead to pleasure or reward. Natural rewards may include things such as food, positive social interaction, or even humor. Pleasurable behaviors such as eating, laughing, or laughing are repeated because they activate the brain reward pathway. The brain reward pathway is a collection of neurons (nerve cells) that helps the brain remember and repeat pleasurable behaviors.

Natural rewards lead to increased acetylcholine (a chemical messenger) in the brain. Acetylcholine attaches to receptors on the surface of neurons (nerve cells) in the brain reward pathway. When acetylcholine binds to these receptors, the neurons are activated and release another neurotransmitter (chemical messenger) called dopamine. The release of dopamine triggers feelings of pleasure. Dopamine also helps the brain remember a pleasurable behavior so that it is repeated.

**Nicotine and the Brain Reward Pathway**  
When you vape, nicotine enters your body and travels to the brain reward pathway. Nicotine mimics the shape of natural acetylcholine and it can fit into the receptors on the neurons in the brain reward pathway. When nicotine binds to these receptors, the neurons release dopamine. The release of dopamine triggers a pleasure response and causes you to repeat vaping.

**Nicotine Tolerance**  
People who use develop a tolerance for nicotine. Tolerance means that a given dose of nicotine produces less of an effect, and that increasing doses of nicotine are needed to get the pleasure response. Tolerance occurs because nicotine results in an increased number of nicotine receptors in the brain reward pathway. When the number of nicotine receptors increases, a person needs more nicotine to fill enough receptors to cause the release of dopamine.

**Nicotine Dependence**  
Using nicotine can quickly lead to nicotine dependence. Dependence means that the user needs nicotine throughout the day just to function comfortably. When nicotine levels drop, a user will often get headaches, shakiness, and an overall feeling of craving, moodiness, and frustration. As time as they vape again, they will feel much better. People with nicotine dependence vape enough nicotine throughout the day to keep the levels of nicotine in their brain at a relatively constant range.

**Nicotine Addiction**  
Addiction to nicotine occurs when a person can no longer control how often they use nicotine. Vapers are often not aware that nicotine addiction is happening until they discover how difficult it is to quit. When people who are addicted to nicotine stop vaping, the nicotine level in their bloodstream drops. This results in physical withdrawal symptoms (cravings, weight, headaches, and fatigue) and emotional withdrawal symptoms (anxiety, depression, moodiness, and difficulty concentrating). These symptoms make it difficult to quit.

The symptoms of nicotine withdrawal occur because the brain has an excess of nicotine receptors that are unoccupied. The good news is that when someone completely quits vaping, the number of nicotine receptors will gradually return to normal (non-vaping) levels. This allows natural rewards to activate the brain reward pathway to release dopamine. As that happens, the urge to vape will gradually occur less often and withdrawal symptoms will not be as intense.

## Next Generation Science Standards (NGSS) Correlation

| <b>Working Towards Performance Expectations</b>                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>MS-LS1-8.</b> Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories. [Assessment Boundary: Assessment does not include mechanisms for the transmission of this information.]                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                  |
| <b>Science and Engineering Practices</b><br><br><b>Developing and Using Models</b> Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems. <ul style="list-style-type: none"> <li>Develop and use a model to describe phenomena.</li> </ul> | <b>Disciplinary Core Ideas</b><br><br><b>LS1.D: Information Processing</b> <ul style="list-style-type: none"> <li>Each sense receptor responds to different inputs (electromagnetic, mechanical, chemical), transmitting them as signals that travel along nerve cells to the brain. The signals are then processed in the brain, resulting in immediate behaviors or memories.</li> </ul> <b>LS1.A: Structure and Function</b> <ul style="list-style-type: none"> <li>Within cells, special structures are responsible for particular functions, and the cell membrane forms the boundary that controls what enters and leaves the cell.</li> </ul> | <b>Crosscutting Concepts</b><br><br><b>Cause and Effect</b> <ul style="list-style-type: none"> <li>Cause and effect relationships may be used to predict phenomena in natural systems</li> </ul> |

# Nicotine Addiction: Breaking Up With My Vape

## *Teacher Answer Key*

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### Part 1: Just Trying a Vape

When I first tried vaping, I just wanted to see what it was like. I was out with friends who shared their vape with me. The vape (e-cigarette) was small and cute. It didn't make me smell bad. It came in yummy flavors like mango and mint. It didn't seem unhealthy like smoking a cigarette. I couldn't even tell that it contained nicotine.

The next day, I went to a convenience store and bought a vape starter kit and e-liquids of different flavors. At first, I just vaped when I was out with friends. But now I'm vaping at school and at home.

I heard on TV that nicotine changes how people's brains work. I was curious about how vaping nicotine might affect my brain. When I searched online for "brain nicotine," I kept seeing words like "brain reward pathway," "receptors," and "dopamine." I had trouble figuring out how these three things worked to explain why I enjoyed vaping.

1. Read the "Natural Rewards and the Brain Reward Pathway" part of the **Nicotine and the Brain** reading sheet in your kit. According to this reading, what is the function of the brain reward pathway?
2. List two examples of "natural rewards" that could activate the brain reward pathway.

### **Before Vaping**

**How does the brain reward pathway respond to natural rewards (before a person vapes nicotine)?**

You will use the information in the “Natural Rewards and the Brain Reward Pathway” part of the **Nicotine and the Brain** reading sheet to model how a neuron (nerve cell) in the brain reward pathway responds to natural rewards.

3. The **Brain Reward Pathway** sheet in your kit shows one neuron (nerve cell) in the brain reward pathway. You will use this sheet to model what happens when the neuron responds to a natural reward.

4. Place three yellow cups on three of the yellow stars on the neuron (nerve cell) on the **Brain Reward Pathway** sheet.

According to the **Key to Model Parts**, what do the yellow cups represent?

5. Place four blue beads on the four blue stars on the neuron on the **Brain Reward Pathway** sheet.

According to the **Key to Model Parts**, what do the blue beads represent?

6. When your brain recognizes things like a friend's smile, a delicious piece of candy, or a hug, your brain releases a chemical messenger called acetylcholine.

According to the **Key to Model Parts**, which model piece represents acetylcholine?

7. Acetylcholine attaches to receptors on the surface of neurons (nerve cells) in the brain reward pathway. How would you show this in your model?

8. When acetylcholine fits into the receptor, an electrical message travels through the neuron and triggers the release of dopamine from the end of the neuron. How would you show the release of dopamine from the end of the neuron into the pleasure and remembering regions in your model?

9. When dopamine is released into these brain regions, a person experiences an emotion—pleasure. Which model part could you add to the emotion circle to show pleasure?
10. A neurotransmitter is a chemical messenger that carries information from one part of the nervous system to another. Which two parts of your model represent neurotransmitters in the brain reward pathway?
11. Return the green plugs to the bag of model parts. Place the blue beads back on the stars at the ends of the neuron. Remove the happy face from the emotion circle.

### **After Vaping Nicotine**

#### **How does the brain reward pathway change when a person vapes nicotine?**

You will use the information in the “Nicotine and the Brain Reward Pathway” part of the **Nicotine and the Brain** reading sheet to model how a neuron in the brain reward pathway changes when someone vapes nicotine.

12. According to the **Key to Model Parts**, which model part should you use to represent nicotine?
13. Which model part should you use to represent a nicotine receptor?
14. How will you show nicotine attaching to nicotine receptors?
15. When nicotine attaches to a nicotine receptor, a signal is sent along the neuron. When the signal reaches the end of the neuron, it triggers the release of dopamine. How will you show the release of dopamine?

#### **IMPORTANT NOTE:**

The receptors (yellow cups) in the model are actually called **nicotinic acetylcholine** receptors because they have the correct shape to bind to both nicotine and acetylcholine molecules. To make it easy for you to remember that nicotine binds to these receptors when people vape, we will now call them **nicotine receptors**.

16. How will you show that dopamine results in a rewarding pleasure emotion?
17. Both nicotine and acetylcholine can cause a pleasure response. Explain how this is possible.
18. Based on the way the brain responds to nicotine, do you think that people who vape nicotine will be likely to continue vaping? Explain your answer.
19. Return the red plugs to the bag of model parts. Place the blue beads back on the stars at the ends of the neuron. Remove the happy face from the emotion circle.

## Part 2: Vaping more

It did not take me long to discover that I needed to vape more frequently just to feel “normal.” I switched from a 3% e-juice pod to a 5% e-juice pod. I went from vaping a pod every two weeks to vaping more than one pod a day. Vaping was getting expensive. I wondered what was happening to my brain to make me need to vape more frequently.

Base your answers to questions 1 through 5 on the information above and the “Nicotine Tolerance” part of the **Nicotine and the Brain** reading sheet in your kit.

1. Claim: The person in the story is experiencing nicotine tolerance. Underline two pieces of evidence in the reading in the box above that support this claim.
2. Change your model to show what happens to the receptors on the neuron when continued vaping leads to nicotine tolerance. Describe how you changed your model.
3. Dopamine is only released when most or all of the nicotine receptors are full. What effect would the change in question 2 have on dopamine release and the face in the emotion circle?
4. Change your model to show what vapers with nicotine tolerance would need to do to return to normal (happy) pleasure emotions. Describe the changes that you made to the model for each of the parts below.
  - Red plugs
  - Blue beads
  - Emotion pieces

### Part 3: Need my vape!

My parents and some of my friends thought I vaped nicotine to get high. They don't understand that I vape throughout the day just to avoid cravings and feel sort of like I did before I started vaping.

I kept vapes and e-juice at school, at home, and in my backpack so I wouldn't be trapped without my nicotine "fix." If I went too long without vaping, the cravings started. I got anxious, depressed, angry and had trouble concentrating.

I avoided situations where I couldn't vape—such as track practice and chorus. Things that I used to enjoy no longer made me happy. My friends were angry that I stopped doing things with them. I thought about quitting, but never made it more than an hour or two without vaping again.

Base your answers to questions 1 through 3 on the information above and the "Nicotine Dependence" part of the **Nicotine and the Brain** reading sheet.

1. How is nicotine dependence different from nicotine tolerance?
2. Claim: The person in the story is experiencing nicotine dependence. Underline two pieces of evidence in the reading in the box above that support this claim.
3. Do most people who are nicotine-dependent vape nicotine to avoid feeling uncomfortable? Support your answer with one sentence from the **Nicotine and the Brain** reading.

## Part 4: Breaking up is hard to do

I never knew how hard it would be to stop vaping. I wish that I had never started! My friends call me a “vape addict” and I finally realized they are right. I can’t control my vaping. My nicotine cravings keep me sneaking out for a quick vape and avoiding any situation that would keep me from vaping.

Breaking up with my vape is hard to do. I tried quitting several times but I couldn’t even make it through a day without serious withdrawal symptoms. I was so miserable! Strong cravings, anxiety, depression, anger, and trouble sleeping were just a few of the symptoms that made me go back to vaping.

Vaping was controlling my life. I couldn’t go anywhere or do anything without planning where I would get my chances to vape.

Base your answers to questions 1 through 5 on the information above and the “Nicotine Addiction” part of the **Nicotine and the Brain** reading sheet in your kit.

1. Claim: The person in the story is experiencing nicotine addiction. Underline two pieces of evidence in the reading in the box above that support this claim.
2. Explain how you would change your model to show the brain of an addicted person who had quit vaping a day ago.
3. How does your model show why people find it difficult to quit vaping?
4. Explain how you would change your model to represent the brain of someone who has successfully quit vaping for a year.
5. Summarize: Why is it so difficult for people to quit vaping nicotine?

## Part 5: The Quit Vaping Program

Counselors in my school want to start a new program - the **QV** (Quit Vaping) program to help people quit vaping. Several of my friends are going to join the program. They want me to join too. I'm ready to try quitting again. Maybe the program will help me succeed in quitting.

Do you want to quit vaping?  
Do you want to help friends and family members to quit vaping?

**Join the Quit Vaping Program**

1. People are more likely to succeed in quitting if they understand the risks associated with vaping. In addition to the risks of addiction, there are other risks associated with vaping. Put X's in front of the two risks that you feel are the most convincing reasons to quit vaping.

\_\_\_\_\_ Not much is known about the safety of inhaling combinations of the different chemical mixtures found in e-cigarette vaping liquids (e-juices).

\_\_\_\_\_ Regulators are working on policies to make sure that e-cigarettes are safe, but the rapid changes in the e-cigarette market have outpaced regulation.

\_\_\_\_\_ Most e-cigarette vaping liquids (e-juices) contain nicotine. Nicotine is a poison.

\_\_\_\_\_ Vaping liquids (e-juices) contain a variety of potentially harmful substances such as flavorings, volatile organic compounds, and cancer-causing chemicals.

\_\_\_\_\_ E-cigarette vapor may include metals such as nickel, tin and lead from the device itself. Inhaling these metals is hazardous.

\_\_\_\_\_ It is easy to manufacture "homemade" vaping liquids, so users may not know what chemicals they are vaping.

Source: <https://www.cdc.gov/vitalsigns/youth-tobacco-use/index.html>

2. In addition to the health risks described above, there are social or emotional reasons that people may have for wanting to quit vaping. Suggest **two** additional reasons why people might want to quit vaping.

3. People are more likely to succeed in quitting if they plan things that they can do to make quitting easier. Make a list of **six** things that would make it easier for people who want to quit vaping. Be prepared to share your ideas.

This website has ideas you could use:

**Quit Vaping** <https://teen.smokefree.gov/quit-vaping/how-to-quit-vaping>

4. People who quit vaping may experience low dopamine levels. Increasing dopamine levels could help them to get good feelings back. Make a list of **three** things people could do to naturally increase their dopamine levels and happiness. Be prepared to share your ideas.

This website has ideas you could use:

**Increase Dopamine Levels Naturally** [https://www.healthline.com/nutrition/how-to-increase-dopamine#TOC\\_TITLE\\_HDR\\_12](https://www.healthline.com/nutrition/how-to-increase-dopamine#TOC_TITLE_HDR_12)