

**CATCH**<sup>®</sup>  
MY BREATH

*Middle School*

# Vaping and Life: A Guide to Making Informed Choices

7TH-8TH GRADE | CORE LESSON BUNDLE

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## Background Info

Tobacco use is the leading cause of preventable death; smoking tobacco causes more than 8 million deaths worldwide per year. Nearly all tobacco smoking begins during childhood and adolescence, making underage young people a target and an integral part of the tobacco industry's "business model." While e-cigarettes are less harmful compared to smoking tobacco, they are not harmless and have addicted more than a million teens to nicotine.<sup>1</sup> Although these products are illegal to sell to youth, they are a crucial part of the "business model" for the tobacco industry. While most people today are informed about the health hazards and risks of cigarette smoking, there are many misconceptions about e-cigarettes and the dangers they pose to a person's health and wellbeing.

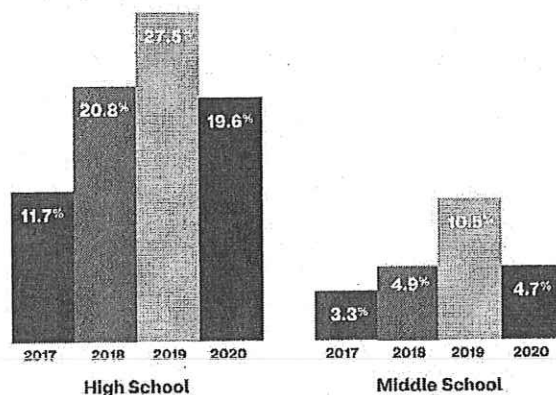
The aerosol released by e-cigarettes is not harmless water vapor, may contain cancer-causing chemicals, heavy metals (such as nickel, tin, and lead), and almost always contains the addictive tobacco-derived compound, nicotine. Nicotine is considered a psychoactive substance that creates changes in mood and behavior, especially in high doses and in young people.<sup>1</sup> One of the most commonly sold e-cigarette in the United States, JUUL, contains as much nicotine in a single pod as an entire pack of 20 cigarettes.<sup>1</sup> Disposable versions of e-cigarettes, such as Puff Bar and STIG, are popular among youth and deliver equally high doses of nicotine.

The growing use of e-cigarettes, also called "vaping," especially by young people, is a serious public health threat. A study found that young adults who vape are more than 6.8 times as likely to begin smoking cigarettes within 18 months than their peers who do not vape.<sup>1</sup> Nicotine exposure in adolescence has also been shown to harm brain development, which continues until age 25, and may also increase risk for future addiction to other drugs.<sup>4</sup>

According to the National Youth Tobacco Survey, e-cigarettes are currently the most commonly used tobacco products among middle and high school

### The Youth Vaping Epidemic

This chart represents students who have used an e-cig in the last 30 days.



students.<sup>5</sup> From 2017 to 2019, there was a 135% increase in high-school e-cigarette use and a 218% increase in middle-school e-cigarette use.<sup>5</sup> The story has shifted slightly in 2020—19.6% of high school students and 4.6% of middle school students report using e-cigarettes within the past 30 days.<sup>6</sup> The results reflect over 2.5 million middle and high schoolers using the product in the past 30 days. Even more concerning, 38.9% of current high school e-cigarette users and 20% of current middle school e-cigarette users were frequent or daily users, a strong indication of addiction.<sup>7</sup> For that reason, it is imperative that students learn about nicotine addiction and the serious health risks associated with e-cigarettes. They must learn strategies for making healthy decisions and techniques for not using cigarettes and e-cigarettes and encourage their peers to do the same.

1 - [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)

4 Khuder, S. A., Dayal, H. H., & Mutgi, A. B. (1999). Age at smoking onset and its effect on smoking cessation. *Addictive behaviors*, 24(5), 673-677

5 Cullen, KA, et al., "e-Cigarette Use Among Youth in the United States, 2019" *JAMA*, published online November 5, 2019.

6 <https://doi.org/10.15585/mmwr.mm6722a3>

7 Evans-Polce, R, et al., "Trends in E-Cigarette, Cigarette Cigar, and Smokeless Tobacco Use Among US Adolescent Cohorts, 2014-2018," *American Journal of Public Health*, 110(2): 163-165, 2020..

# Part 1: Cotton Candy Sewer Water

## Learning Objectives

Students will:

- Analyze the validity of two vaping myths.
- Design a new label for vape juice that educates the public on its ingredients and health effects.

## Timing

45 minutes

## Standards

### National Health Standards

- 3.5.1: Identify characteristics of valid health information, products, and services.
- 5.5.5: Choose a healthy option when making a decision.
- 5.5.6: Describe the outcomes of a health-related decision.

### Common Core English Language Arts Standards

- 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.
- SL.5.2: Summarize a written text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.

## Myths Addressed

**Myth 1:** E-cigarette vapor is just flavored water.

**Myth 2:** E-cigarettes do not contain nicotine.

## Materials

- Nutrition Labels handout, one to project or one per student
- Myth Busting Cards handout, one per student
- Vape Juice Label handout: Just the Facts, enough for half the class
- Drawing materials, for the class to share

## Engage

- Lead the class in brainstorming: What are some examples of healthy foods and beverages?
- Then probe students to consider: When you are deciding what to eat or drink, what can you look at to help you understand what the food or drink is made of and whether it is healthy? After hearing students' ideas, remind them that foods and beverages always contain a nutrition label and an ingredient list.
- Project and/or distribute the *Nutrition Labels* handout. Briefly point out where to find the sugar, percent daily value of vitamins, and the ingredient list on these labels.
- Then ask students to think-pair-share\*: If you were to choose the healthier option between these two choices, which one would you choose? Why?

\* In a think-pair-share, students think about the question independently, discuss their answers with a partner, and then share their thoughts with the larger class.



## Investigate & View

- Explain that it is important to take the time to understand an item's health effects before we eat it, drink it, or use it. We can understand the effects of what we eat and drink by taking a moment to read nutrition facts labels and ingredient lists. Other things that we expose our body to, like vaping, may take a little more time to understand. However, vaping can have a huge effect on our body and health. It's therefore important that we take the time to investigate its ingredients and health consequences!
- Distribute the *Myth Busting Cards* handout to each student, and ask a volunteer to read the two statements aloud.
- Explain that the class is about to watch a short video that will look at the ingredients in e-cigarettes. As they watch, they should jot notes to answer the questions provided. They will then use their notes to either confirm or debunk these myths!

**Tip:** It may be helpful to play the video more than once.

- Once the video is complete, allow student pairs a couple of minutes to share and compare their notes. They should then work together to decide whether each myth should be confirmed or denied.
- Conclude this portion of the activity by reading each myth aloud and asking the class to share a thumb up or thumb down to indicate whether each statement is true or false.

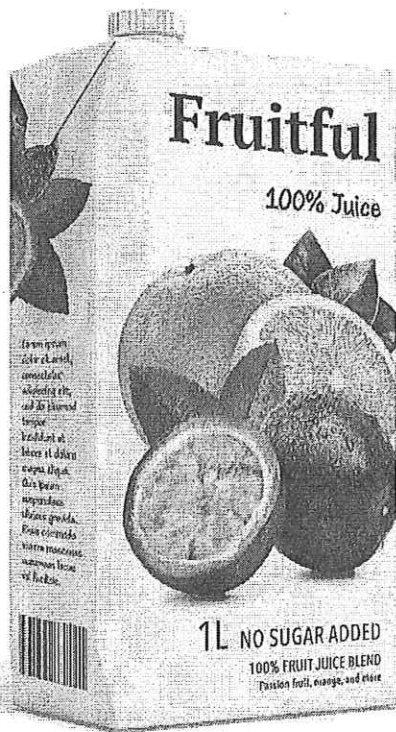
## Apply

- Challenge the class to create a factual label for vape juice that explains all of its ingredients *and* its effects on the human body, so people are able to make informed decisions about vaping.
- Divide students into pairs and distribute one *Vape Juice Label* handout to each pair.
- Review the directions provided and then encourage pairs to begin.
- When there are about 10 minutes left in the class session, instruct each pair to share their work with another group and explain the reasoning behind their design and information choices.
- Then encourage pairs to spend the last five minutes adding additional details to their labels based on ideas inspired by their peers.



# Nutrition Labels

## Juice A



<b>Nutrition Facts</b>		Serving Size: 8 fl oz
Amount	% Daily Value	
Calories	120	
Fat (0 g)	0%	
Saturated (0 g)	0%	
Trans (0 g)	0%	
Cholesterol (0 mg)	0%	
Sodium (10 mg)	0%	
Potassium (290 mg)	8%	
Carbohydrate (30g)	10%	
Fiber (0 g)	0%	
Sugars (16 g)		
Protein (0.4 g)		
Vitamin A	0%	
Vitamin C	100%	
Calcium	0%	
Iron	2%	
<b>INGREDIENTS:</b> Passion fruit juice, orange juice, peach purée, pear juice, mango purée.		

## Juice B



<b>Nutrition Facts</b>		Serving Size: 8 fl oz
Amount	% Daily Value	
Calories	110	
Fat (0 g)	0%	
Sodium (0 mg)	0%	
Carbohydrate (30g)	10%	
Sugars (16 g)		
Cholesterol (0 mg)	0%	
Protein (0 g)		
Vitamin D	0%	
Calcium	0%	
Iron	0%	
Potassium	1%	
Manganese	2%	
<b>INGREDIENTS:</b> High fructose corn syrup, pure filtered water, concentrated grape juice, less than 1% of: concentrated pineapple, pear and apple juices, natural flavors, citric acid (provides tartness), grape skin extract (for colors), sugar.		

# Myth **Busting** Cards

**Statement #1:** E-cigarette vapor is just flavored water.

Collect Evidence:

- What is e-cigarette vapor made of?
  
  
  
  
  
  
- How does this vapor affect your body?

Decide: (circle one)

**Confirmed**

**Busted**

**Statement #2:** E-cigarettes do not contain nicotine.

Collect Evidence:

- Do e-cigarettes contain nicotine?
  
  
  
  
  
  
- Do flavored e-cigarettes contain nicotine too?

Decide: (circle one)

**Confirmed**

**Busted**





# Part 2: The Illusion of Control

## Learning Objectives

Students will:

- Validate what they already know and understand about vaping.
- Apply what they learn about vaping to develop explanations about the consequences of e-cigarette use.

## Timing

45 minutes

## Standards

### National Health Standards

- 5.5.6: Describe the outcomes of a health-related decision.
- 7.5.1: Identify responsible personal health behaviors.
- 8.5.1: Express opinions and give accurate information about health issues.

### Common Core English Language Arts Standards

- 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.
- SL.5.2: Summarize a written text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
- W.5.4: Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.

## Myths Addressed

**Myth 1:** Vaping is harmless.

**Myth 2:** I can't get addicted.

## Materials

- 4 pieces of paper or notecards, labeled "Agree," "Disagree," "Strongly Agree" and "Strongly Disagree"
- Watch & Jot handout, one half page per student
- Talking sticks (actual sticks, paint sticks, rulers, etc.), enough for one-fifth of the class

## Engage

- Begin class by asking students to raise their hand if they have seen people vape before.
- Then post the **Agree, Disagree, Strongly Agree,** and **Strongly Disagree** signs in your classroom's four corners.
- Explain:
  - You are about to read a couple statements aloud.
  - As you read each one, students should consider what they think they already know about vaping. They should then walk quietly to the corner of the classroom that best explains their position on your statement.
  - Acknowledge that students may not be certain about their opinion, and it's okay to make an educated guess.
- Then share the following statement: Vaping is harmless.

- Give students a moment to think about whether they agree, disagree, strongly agree, or strongly disagree before they move.
- Once students have moved to a corner of the classroom, encourage them to share their reasoning with their like-minded peers. Then ask one or two students from each group to briefly summarize their group's rationale.
- Complete the same process with the second statement: I can't get addicted to vaping.
- Wrap up by asking students to show you with their fingers, on a scale of 0 (not at all sure) to 10 (very sure) how confident they feel about these opinions.

## Investigate & View

- Explain that students are about to watch a short video about these vaping statements so they can develop more informed opinions.
- Distribute a *Watch & Jot* handout to each student, and review the questions provided.
- Tell students that as they watch the video, they should jot notes that will help them answer these questions.

**Tip:** It may be helpful to play the video more than once or to pause after key parts to allow for notetaking.

- When the video is complete, give the class a few minutes to work their notes into more complete responses.

## Apply

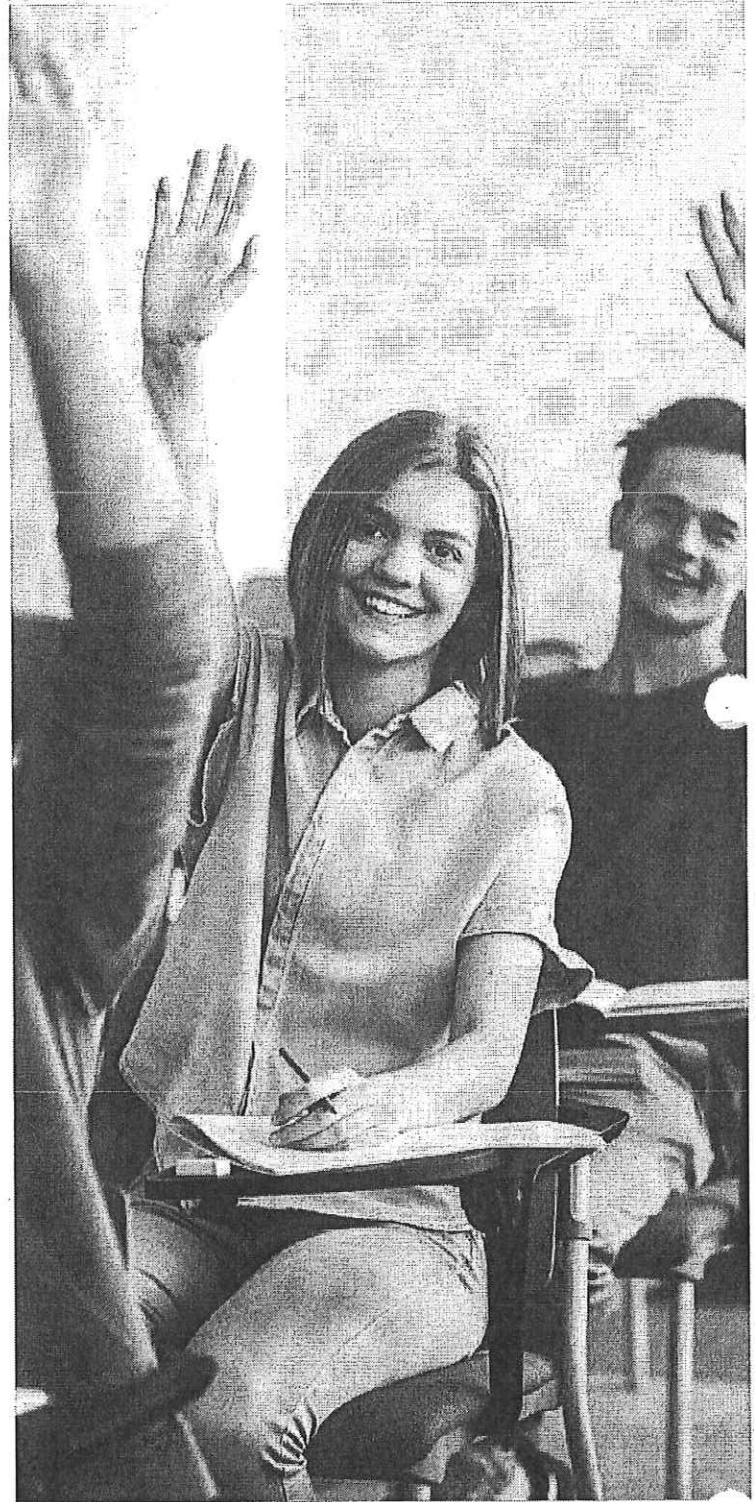
- Form groups of about five students, and encourage each group to sit in a circle with their *Watch & Jot* notes.
- Tell the class you are going to pose two questions. The class should pretend that a

younger child who looks up to them is asking the questions. For this reason, they should do their best to explain everything as clearly, carefully, and truthfully as possible.

- Then give a talking stick to one person in each group, and explain the discussion guidelines:
  - The person with the talking stick is allowed one minute of uninterrupted speaking. The speaker should always use their video notes to support their thoughts.
  - All other group members should listen to the speaker. The listeners may take notes as their peers speak if they hear something they would like to include in their own answer.
  - The group will have a chance to discuss all together once everyone has spoken.
- Write the first question (*Vaping isn't bad for me, is it?*) where everyone can see it, and read it aloud.
- Tell the class that every person now has one minute to share how they would answer this question if a younger student asked, and instruct the student holding the stick in each group to begin sharing their answer. Keep an eye on the time, and remind students to pass the stick to the next person in the circle every 60 seconds.
- Once all group members have had the chance to speak, explain that the whole group will have an additional minute to wrap up their discussion, add any final thoughts, and/or respond to what their group members have said.
- Repeat this process with the second question: *If I tried vaping, would it be easy to stop? Why or why not?*
- Then bring the class back together, and ask them to reconsider their original positions based on the information they now know.

They should again move to the corner of the room that best represents their opinion on the following two statements:

- Vaping is harmless.
- I can't get addicted to vaping.
- Wrap up by leading a final group discussion around the question: Based on the facts we now know, what are some of the main reasons to say no to vaping?





# Watch & Jot

STUDENT HANDOUT

What is **known** about vaping effects on the body?

What is **unknown** about vaping's effects on the body?

Is vaping addictive?



# Watch & Jot

STUDENT HANDOUT

What is **known** about vaping effects on the body?

What is **unknown** about vaping's effects on the body?

Is vaping addictive?

# Part 3: Disease Anyone?

## Learning Objectives

Students will:

- Analyze the perceived consequences of vaping through another person's perspective.
- Construct their own opinion on vaping's consequences and develop their stance with key details.

## Timing

45 minutes

## Standards

### National Health Standards

- 2.5.4: Describe how the school and community can support personal health practices and behaviors.
- 5.5.6: Describe the outcomes of a health-related decision.
- 7.5.1: Identify responsible personal health behaviors.
- 8.5.1: Express opinions and give accurate information about health issues.

### Common Core English Language Arts Standards

- 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.
- W.5.1: Write opinion pieces on topics or texts, supporting a point of view with reasons and information.

- W.5.4: Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.

## Myths Addressed

**Myth 1:** Vaping is not a big deal—Everyone does it.

**Myth 2:** Vaping has no social consequences.

## Materials

- Perspectives handout, one per student
- My Opinion handout, one per student
- Editorial handout, one per student

## Engage

- Begin with a class-wide brainstorm. Tell students: People make mistakes all the time. Sometimes these actions cause problems and other times they're not a big deal. What are some examples of mistakes that are not a big deal?
  - If needed, kick off the brainstorming with an example of your own—such as making a wrong turn, missing a basket during practice, or overcooking your dinner. Then record a list on the board as students share ideas.
- Once the list is complete, ask students to consider: Why are these mistakes not a big deal? Help the class arrive at the understanding that one of the main reasons these mistakes are not a big deal is because they do not have serious or lasting consequences.
- Then add "vaping" to the list. Ask: Is vaping a big deal? Encourage students to demonstrate their answer through a head nod or shake.

## Investigate & View

- Tell students that they are about to watch a quick video that will investigate this further.
- Distribute a *Perspectives* handout to each student, and read through the roles in the top left box. Explain that each student will be putting themselves in the shoes of one of these people as they watch the video and learn about some of the consequences of vaping.
- Instruct students to select one role, and try to ensure the roles are distributed roughly equally among the class.
- Then review the instructions in the top right box of the handout. Explain that as they watch the video through this person's eyes, they should write down at least three facts that may help this person determine if vaping is a big deal.

It may be helpful to provide an example such as: If you're watching through the eyes of a police officer and the video mentions whether underage vaping is illegal, a police officer would be very interested in this information. (And many of the other perspectives would likely find this important, too!)

- Show the video and remind students to jot notes on the top half of their handout.
- Once the video is complete, instruct students to use their notes to answer the remaining three questions on the handout—again from their assigned perspective.
- Then, form small groups around the classroom with at least three different perspectives represented in each group. Instruct groups to share and discuss their answers to the handout's third question: *Do you think vaping is a big deal?*

## Apply

- Now acknowledge that students were *not* on this list of perspectives...even though that's the perspective of everyone in the class!
- Pass out one *My Opinion* handout and one *Editorial* handout to each student, and read the directions on the *My Opinion* handout aloud.
- Give students until nearly the end of the class session to work on their editorial. Encourage students to watch the video a second time if they think it would be helpful.
- When there are just a few minutes left in the session, regroup as a class and discuss the students' writing. Challenge students to articulate: Why is vaping a big deal? Do social consequences of vaping make it less of a big deal or more of a big deal?





# My Opinion

**Directions:** Place yourself back into your own shoes. It's now time to develop your own opinion based on the video you watched, the notes you took, and the discussion you had with your classmates.

Write an editorial (or opinion piece) that could be published in your school newspaper. In your editorial, explain:

- Is vaping a big deal? Why or why not?
- What social consequences does vaping have?

Use the space below to jot ideas and facts that you want to include in your writing. Then complete your editorial on the following page.

**Is vaping a big deal? Why or why not?**

**What social consequences does vaping have?**

**Notes**





# What's Hiding in E-Cigarettes?

CARD SORT 1 of 2

**Instructor Directions:** Cut each set into individual cards. Each pair of students will need one complete set.

**Substance:**

**Acetaldehyde** (ac-et-al-de-hyde)

**Notes:**

- Used to produce disinfectants, drugs, and perfumes
- Extremely flammable liquid or vapor
- Has been linked to lung, liver, kidney, and nervous system damage as well as cancer

**Substance:**

**Nicotine** (nic-o-tine)

**Notes:**

- Highly addictive
- Very toxic if inhaled or swallowed
- Causes an increase in heart rate and blood pressure, dizziness, nausea, stomach pain

**Substance:**

**Acrolein** (acro-le-in)

**Notes:**

- Is used as a pesticide to control algae, weeds, bacteria, and mollusks
- May be fatal if inhaled or swallowed
- When inhaled, may cause sore throat, coughing, shortness of breath

**Substance:**

**Propylene glycol** (pro-pyl-ene gly-col)

**Notes:**

- Used in fog machines
- Hazardous if ingested, is an irritant if it comes in contact with skin, eyes, or is inhaled
- May be toxic to the nervous system and cause damage to organs

**Substance:**

**Diacetyl** (di-ace-tyl)

**Notes:**

- Used by manufacturers to give foods a buttery taste
- Vapors can cause damage to airways and abnormal lung function
- When inhaled can cause "popcorn lung," a scarring of the air sacs in the lungs

**Substance:**

**Various Flavor Chemicals**

**Notes:**

- Generally considered safe for ingestion
- Have not been tested for toxic or irritating characteristics when inhaled

**Substance:****2,3-Pentanedione** (pen-tane-dione)**Notes:**

- Used as a food flavoring
- Causes skin, eye, and respiratory irritation
- Linked to "popcorn lung," a scarring of the air sacs in the lungs

**Substance:****Glycerine** (glyc-er-in)**Notes:**

- Added to food, cosmetics, and pharmaceuticals
- Can cause severe lung damage when inhaled
- Inhalation is linked to asthma and lung cancer

**Substance:****Cadmium** (cad-mi-um)**Notes:**

- Used in electroplating and batteries
- Is a toxic heavy metal
- Inhalation can cause damage to kidneys, lungs, bones, and can be fatal

**Substance:****Formaldehyde** (form-al-de-hyde)**Notes:**

- Used in manufacturing building materials, as a preservative in medical labs, and in some glues
- Main ingredient in embalming fluid (used to preserve dead bodies)
- Has been linked to cancer, birth defects, damage to kidneys, liver, and nervous system

**Substance:****Benzene** (ben-zene)**Notes:**

- Found in gasoline
- Inhalation can irritate the respiratory tract and damage the nervous system
- Linked to diseases such as Leukemia and bone marrow failure

**Substance:****Water****Notes:**

- Found in the fluids of most living organisms
- Main component of streams, lakes, and oceans
- Necessary for all known forms of life

# What's Hiding in E-Cigarettes?



STUDENT HANDOUT



**Directions:** As the answers are revealed to the card-sorting activity, record the substances that ARE found in e-cigarettes and notes about each in the table below:



Name of Substance	Notes
<p>What is your reaction to the information you've learned about what's hiding in e-cigarettes?</p>	

# Busting E-Cigarette Myths

**Directions:** Gather evidence in the tables below to confirm or bust each myth about e-cigarettes as you watch the video!

MYTH 1: Using e-cigarettes is less harmful to a person's health than smoking cigarettes.	
Confirmed 	Busted 
Evidence:	Evidence:

MYTH 2: E-cigarettes are less addictive than cigarettes.	
Confirmed 	Busted 
Evidence:	Evidence:

MYTH 3: Using e-cigarettes is a safe alternative to smoking cigarettes.	
Confirmed 	Busted 
Evidence:	Evidence:

# Busting E-Cigarette Myths

STUDENT HANDOUT

## Article

E-cigarette aerosol generally contains fewer toxic chemicals than the deadly mix of 7,000 chemicals in smoke from regular cigarettes. However, e-cigarette aerosol is not harmless. It can contain harmful and potentially harmful substances, including nicotine, heavy metals like lead, volatile organic compounds, and cancer-causing agents.

The e-cigarette aerosol that users breathe from the device and exhale can contain harmful and potentially harmful substances, including:

- Nicotine
- Ultrafine particles that can be inhaled deep into the lungs
- Flavoring such as diacetyl, a chemical linked to a serious lung disease
- Volatile organic compounds
- Cancer-causing chemicals
- Heavy metals such as nickel, tin, and lead

E-cigarettes are still fairly new, and scientists are still learning about their long-term health effects. Here is what we know now.

Most e-cigarettes contain nicotine, which has known health effects.

- Nicotine is highly addictive.
- Nicotine is toxic to developing fetuses.
- Nicotine can harm adolescent and young adult brain development, which continues into the early to mid-20s.

It is difficult for consumers to know what e-cigarette products contain. For example, some e-cigarettes marketed as containing zero percent nicotine have been found to contain nicotine.

Besides nicotine, e-cigarette aerosol can contain substances that harm the body.

- This includes cancer-causing chemicals and tiny particles that reach deep into lungs. However, e-cigarette aerosol generally contains fewer harmful chemicals than smoke from burned tobacco products.

E-cigarettes are not currently approved by the FDA as a quit smoking aid. The U.S. Preventive Services Task Force, a group of health experts that makes recommendations about preventive health care, has concluded that evidence is insufficient to recommend e-cigarettes as a way for adults to stop smoking.

[https://www.cdc.gov/tobacco/basic\\_information/e-cigarettes/about-e-cigarettes.html](https://www.cdc.gov/tobacco/basic_information/e-cigarettes/about-e-cigarettes.html)



# The Cardiovascular System

## Organs affected:

Heart  
Blood vessels

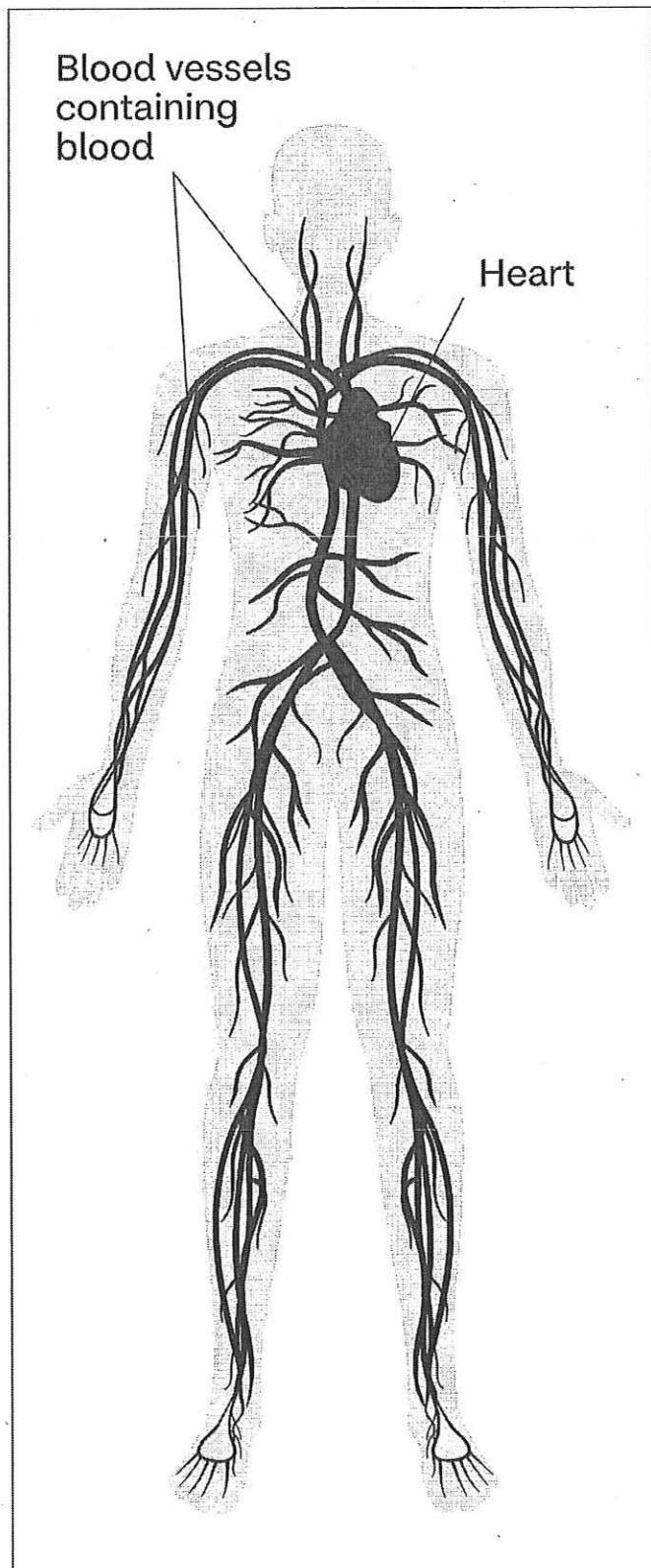
## Normal organ function:

The heart pumps oxygen-rich blood to all of the other organs of your body, and returns oxygen-poor blood to the lungs.

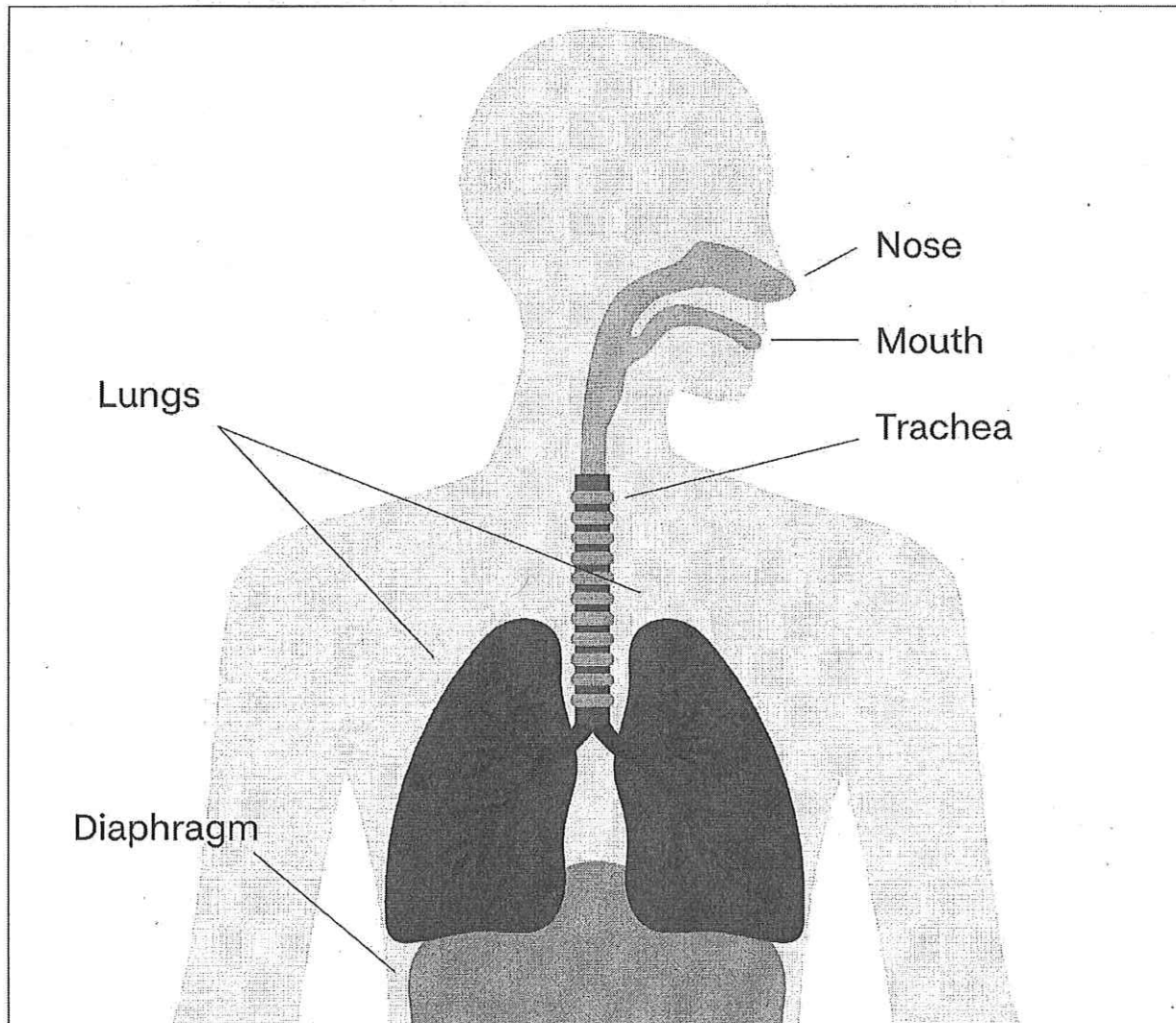
The blood vessels carry blood throughout the body, delivering oxygen and removing carbon dioxide.

## Damage done:

- Nicotine damages blood vessels, making them thicken and grow narrower and unable to move blood properly.
- The lack of blood flowing properly to the heart can cause blockages in the cardiovascular system, much like clogged pipes in a home. This can lead to serious health conditions such as heart disease and stroke.



# The Respiratory System



## Organs affected:

Lungs

## Normal organ function:

The lungs allow you to move oxygen in the air you breathe into your bloodstream, while removing carbon dioxide.

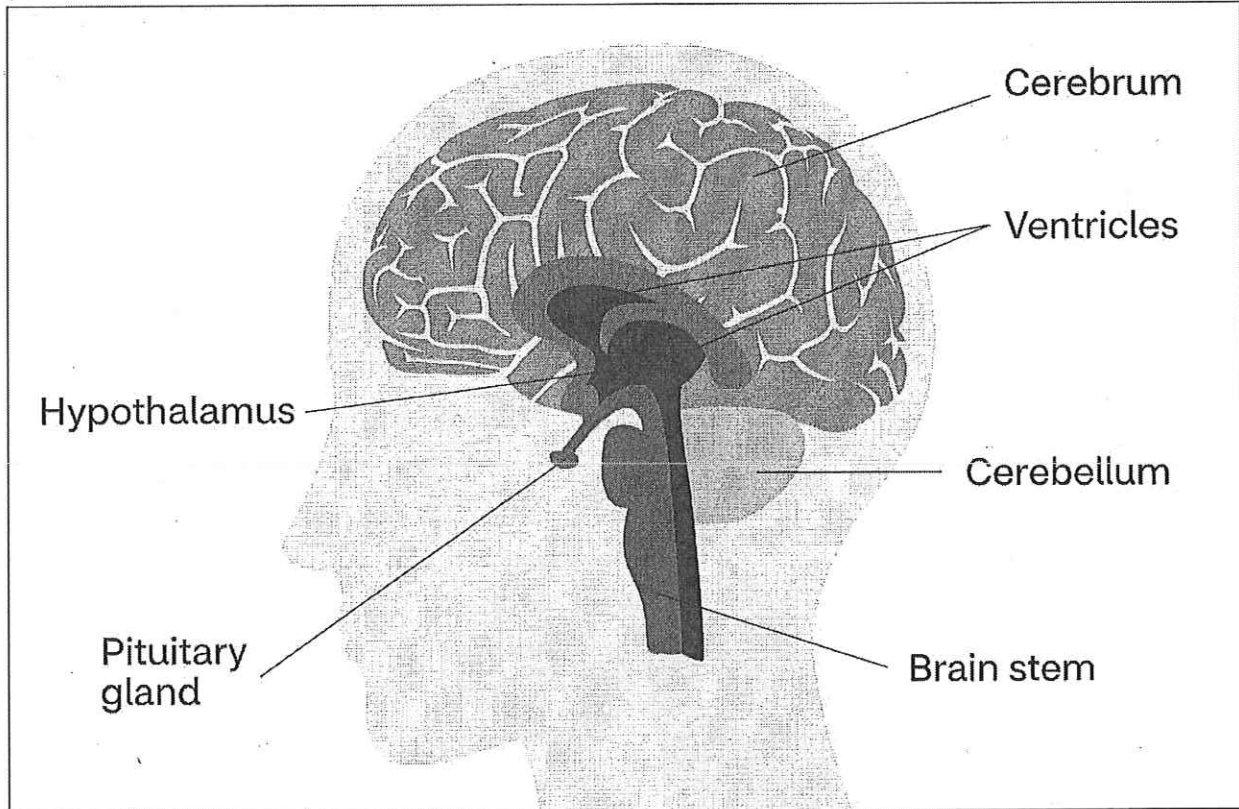
## Damage done:

Harmful chemicals from e-cigarettes and vaping can:

- Damage tiny sacs in the lungs, making it hard to exchange oxygen and carbon dioxide
- Trigger asthma attacks
- Cause diseases of the respiratory system such as emphysema and bronchitis

# The Nervous System

## The Brain



### Area of the brain affected:

Hypothalamus

### Normal organ function:

Along with regulating your body temperature and other important functions, the hypothalamus releases a hormone called **dopamine**, a part of the body's reward system, causing people to feel pleasure and satisfaction.

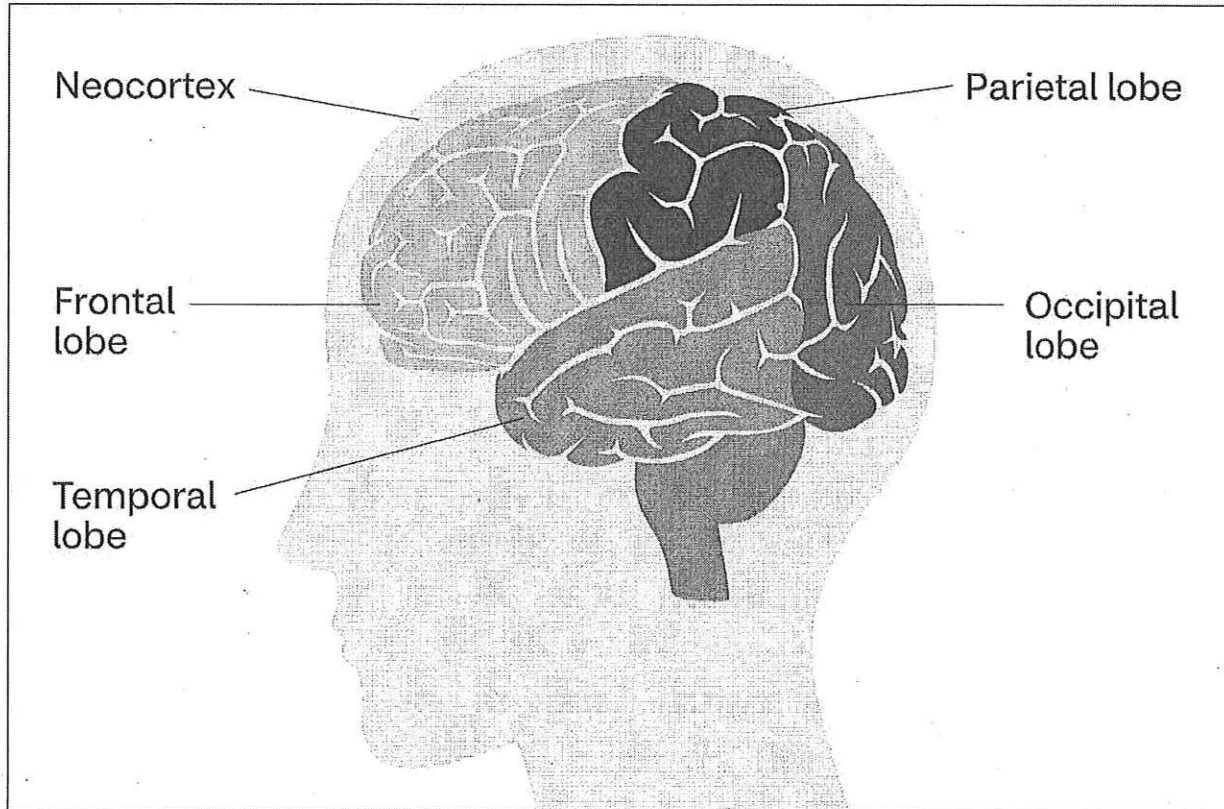
### Damage done:

The nicotine inhaled and exhaled in the aerosol from e-cigarette use causes a release of dopamine in the brain.

- This may not sound so bad, but the pleasure response from the dopamine released when a person is vaping can lead to addiction.
- While dopamine is not harmful to the body, but there are many other harmful chemicals inhaled and exhaled when vaping, and the more a person encounters these chemicals, the more harm they can do to their health.

# The Nervous System

## The Brain



### Area of the brain affected:

Frontal Lobe

### Normal organ function:

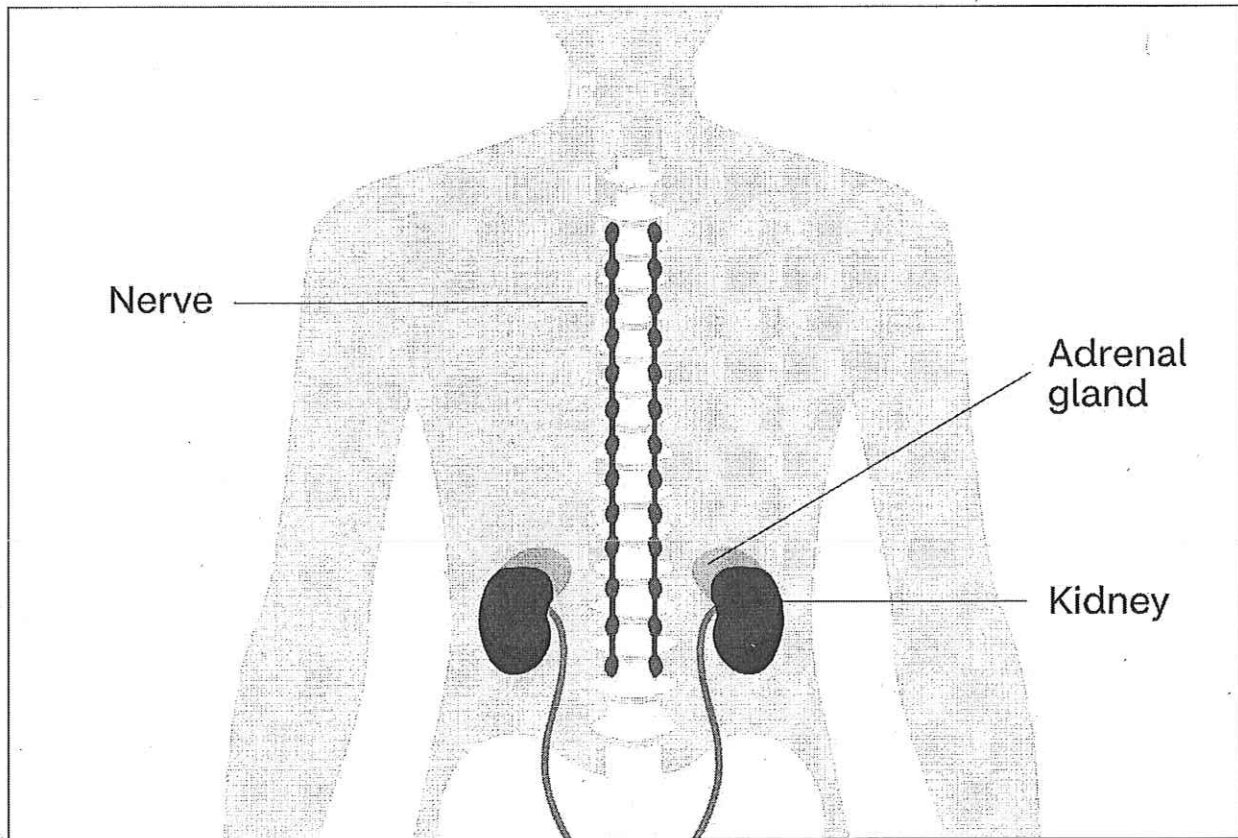
The frontal lobe of the brain is responsible for many things, including decision making, impulse control, attention span, and emotions. It also controls the movement of some parts of the body.

### Damage done:

The outer layer of the frontal lobe is called the **prefrontal cortex**, an area that isn't fully developed until around the age of 25.

- Research has found that nicotine used by young people can disrupt the development of the prefrontal cortex, making it thinner than someone who does not vape.
- Using products that contain nicotine can also disrupt the function of this area of the brain, making it harder for young people to control their impulses and emotions.

# The Endocrine System



## Area affected:

Adrenal glands

## Normal organ function:

The adrenal glands are small glands that sit on top of each of your two kidneys. These glands make and release important hormones into the bloodstream that allow a person to break down food, respond to stress, and fight off infection.

## Damage done:

The **adrenal medulla**, part of your adrenal glands, produce a hormone called **epinephrine**, also known as adrenaline.

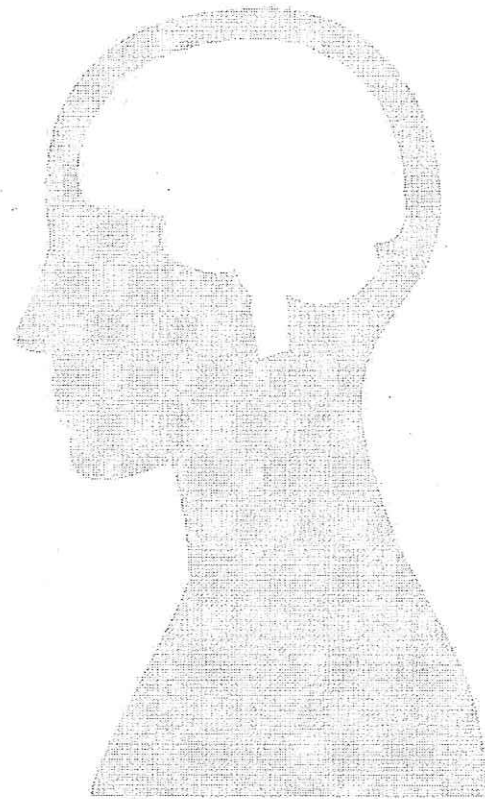
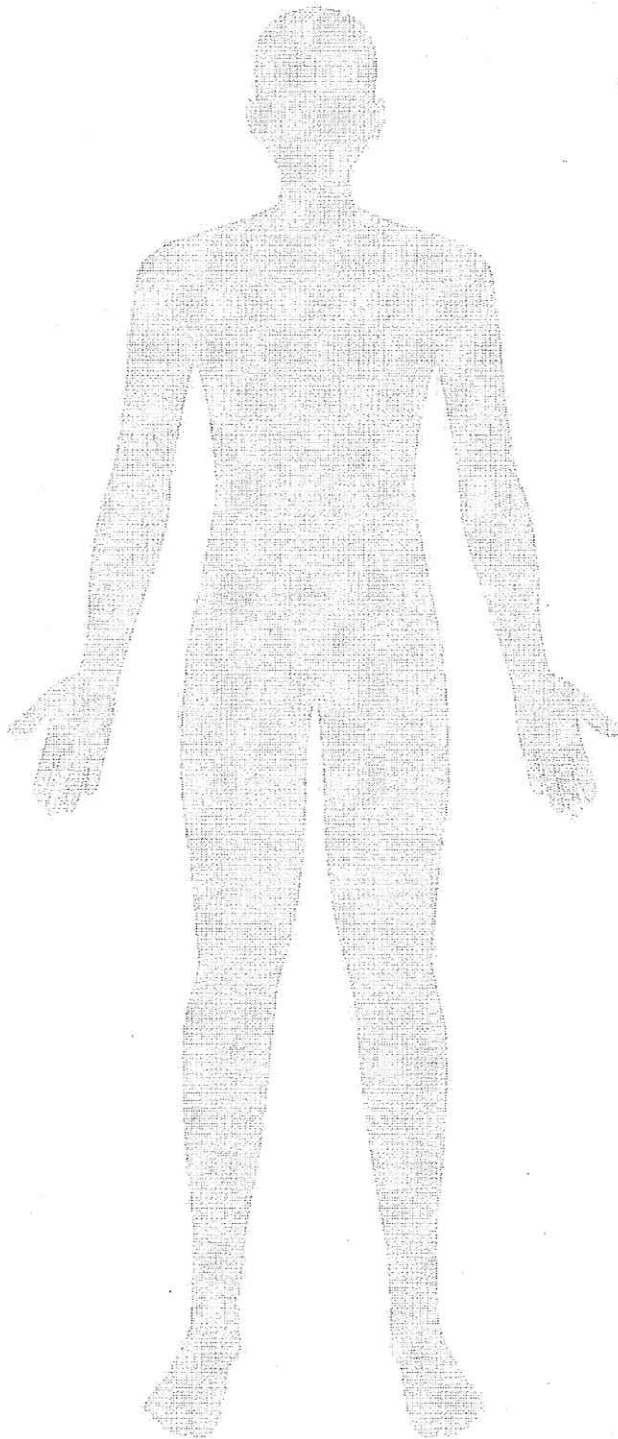
This is often called the “fight or flight” hormone, because it is released when your body thinks there is a threat.

- When epinephrine is released, it increases a person’s blood pressure and heart rate.
- The nicotine inhaled when vaping causes excess epinephrine to be released, which can stress the cardiovascular system that is responsible for blood flow throughout the body.
- High blood pressure and heart rate due to vaping can increase a person’s chances of developing heart disease.



# Human Body

**Directions:** As you visit each part of the body in the gallery walk, draw a picture of the body part on the body diagrams and add information to your sheet about how e-cigarettes and vaping can affect that part.



# Session 2 Exit Ticket

**Directions:** Use your **Human Body** handout to answer the following questions in ONE SENTENCE each. Support your answer with evidence from the gallery walk.

1. Why is it so important that people choose to not use e-cigarettes or vape?

What did you learn from the gallery walk that supports your answer?

2. Why is it especially important for children and young people to avoid vaping?

What did you learn from the gallery walk that supports your answer?

# Your Life. Your Choice.

**Part 1:** Reflect on what you have learned in the three sessions to make a choice regarding e-cigarette use. Remember—it is your life, and you have the power to choose!

**What is your choice regarding e-cigarettes?**

**What are your reasons for your choice?**

# Your Life. Your Choice.

**Part 2:** Think about situations in which you might need to hold strong to your choice and plan how you will react to that situation.

*(Example: If I am offered an e-cigarette by a friend, then I will be able to say "Nah, I'm good" and walk away.)*

<p>If,</p>  <p>Then,</p>
<p>If,</p>  <p>Then,</p>
<p>If,</p>  <p>Then,</p>

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**CATCH MY BREATH** Supported by  
**CVSHealth FOUNDATION**



**Risks of E-Cigarettes**  
SUPPLEMENTAL LESSON BUNDLE

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**CATCH MY BREATH**

Session 1

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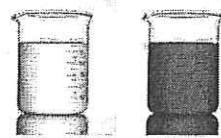
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**CATCH MY BREATH**

### What's in the Glass?



Observe the glass at the front of the classroom.

- What appears to be in it?
- What is your conclusion based on?

What happened when the other clear liquid was added?

What was "hidden" in the glass of water?

What if someone unknowingly drank it?

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**CATCH MY BREATH**

### Learning Summary

- Vapors are substances in a gaseous state.
- Aerosols are tiny particles or droplets that are inhaled and exhaled by an e-cigarette user after the flavored e-liquid is heated.
- E-cigarettes contain many chemicals that can have harmful effects on the body.
- There are many misconceptions that people have about e-cigarette aerosol.
- It is important that people are informed about the potential health risks of using e-cigarettes.

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**CATCH MY BREATH**

## Session 2

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**CATCH MY BREATH**

### Activity: Busting E-cigarettes Myths!

With a partner:

1. Read each statement about e-cigarettes.
2. Discuss each statement with your partner and decide if you think it should be **CONFIRMED** or **BUSTED**.
3. Watch the video and record evidence needed to **CONFIRM** or **BUST** each statement on your sheet.

**WHAT DID YOU CONCLUDE?**

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**CATCH**  
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### Gallery Walk

You have four minutes to study each poster.

**04:00**

Click the clock to start time.



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LIVE AT RISK

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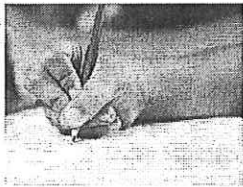
**CATCH**  
MY BREATH

### Exit Ticket

Think about the following questions:

Why is it so important that people choose not to smoke or vape?

Why is it especially important for children and young people to avoid vaping?



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LIVE AT RISK

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**CATCH**  
MY BREATH

### Learning Summary

- The serious health risks that come from e-cigarettes and vaping far outweigh any good feeling that a person might get from using tobacco products or nicotine.
- Young people and children are especially at risk of health problems from e-cigarettes and second-hand aerosol, as their bodies are still developing.
- Exposing young people to the chemicals in aerosol from using e-cigarettes can disrupt their brain development and lead to future addiction and health problems.
- Use of e-cigarettes is often seen as a safer alternative for adult smokers; however, both cigarette smoke and e-cigarette aerosol contain harmful chemicals and both second-hand smoke and second-hand aerosol expose people involuntarily to chemicals.

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LIVE AT RISK

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**CATCH MY BREATH**

Session 3

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**CATCH MY BREATH**

Are high school and middle school students using e-cigarettes?

School Level	2018	2019
High School	20.8%	27.5%
Middle School	4.9%	10.5%

How many high school students choose NOT to use e-cigarettes?  
How many middle school students choose NOT to use e-cigarettes?

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**CATCH MY BREATH**

Why Do Kids Experiment with E-cigarettes?

Can you guess the top 3 reasons?

1. A friend or family member uses them
2. Fun flavors like candy or fruit
3. Thinking e-cigarettes are less harmful than regular cigarettes

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**CATCH MY BREATH!**

### Just Say No! (or something like that...)

**Exit Strategy** – a thoughtful way to get out of an uncomfortable situation  
**Refusal Skill** – something that can help you say "no" in a creative way

Examples:

- "No thanks, I'm good!"
- "Let's do \_\_\_\_\_ instead."
- "E-cigarettes have harmful stuff in them, I'd rather not."
- "My parents would be really upset if I did that."
- "I'm on the soccer team and the coach says absolutely no smoking."



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**CATCH MY BREATH!**

### Learning Summary

- There are multiple ways to say "no" to using e-cigarettes. Some may feel more comfortable to us than others.
- It is important to support peers who also are trying to make good choices. Suggesting exit strategies and refusal skills to friends can be helpful for them.

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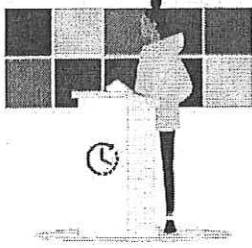
**CATCH MY BREATH!**

### Challenge: Create a PechaKucha Presentation

**10 Images x 20 Seconds!**

**Goal:** Encourage peers to make positive choices about smoking and vaping.

1. Find 10 images that support your goal.
2. Remember to include images that reflect what you have learned about risks to health, alternative activities, and research.
3. Organize your images in a way that will achieve your goal.
4. Present your PechaKucha!



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**CATCH**  
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**Your Life. Your Choice.**

It's time to make a choice

- Take some time to thoughtfully complete the "Your Life, Your Choice." handout.
- Think about all the things you have learned about e-cigarettes as you make your promise to yourself.

*What will you choose?*



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# Session 1: Understand the Choice

## Learning Objectives

Students will be able to:

- **Distinguish** facts about e-cigarettes and tobacco products from common myths.
- **Describe** the negative effects of e-cigarette use.
- **Predict** and **understand** the possible effects tobacco use could have on a teen's life.

## Overview

Session 1 will engage students to think about why using tobacco products, like e-cigarettes, is a big decision. Students will be asked to look at some statements about e-cigarettes and determine if they are true or false. They will investigate nicotine and other chemicals found in e-cigarettes. The session ends with a video as well as a group discussion about the negative consequences of using e-cigarettes.

### Content Areas

Health

### Target Grade Levels

Grades 7 and 8

### Approximate Class Time

35 minutes

## Materials

- **Activity 1a: Understand the Choice**—1 per student
- **Activity 1b: Aerosol Analysis**—1 per group
- **Organ Pictures**—1 set

◦ **Note:** *This one set can be used throughout all class periods. We recommend laminating them if those resources are available to you.*

◦ **Alternative:** *Rather than printing the pictures, you can write the organ system names on the board or butcher paper and have students write responses there.*

- **Pads of sticky notes**—1 per group
  - **Alternative:** *Students can write directly on the paper, board, or organ picture.*
- **Tape** to hang organ pictures
- **Index cards** (or squares of paper)—1 per student
  - **Alternative:** *Students can use the back of a worksheet or scratch paper.*
- **Optional: Activity 1c: Session 1 Review**—1 per student
- **Optional: Parent Info Sheet: 4 Fast Facts**—1 per student

## Educator Prep

- Identify peer facilitators and form peer groups as described in Session 0.
- Print worksheets and materials
  - **Activity 1a: Understand the Choice**—1 per student
  - **Activity 1b: Aerosol Analysis**—1 per group
  - **Organ Pictures**—1 set (See alternatives above)
  - **Optional: Activity 1c: Session 1 Review**—1 per student

- Prepare videos to ensure they are ready to play with sufficient volume
  - Do Vapes Contain Toxic Metals? The Real Cost
  - My Vaping Mistake: How it affected my relationships
  - **Note:** *If you are having trouble accessing the videos, there may be a firewall blocking the videos. Reach out to your IT department for help gaining access.*
- Locate your school code of conduct and policies on tobacco products (e.g., cigars, cigarettes) and e-cigarettes. Identify the disciplinary / restorative practices for violating the policies and insert that information into **Slide 18**.

## Key Terms

- **Aerosol:** The tiny particles or droplets that are inhaled when puffing on an e-cigarette, after the flavored e-liquid is heated.
- **Disposable E-Cigarette:** An e-cigarette device that cannot be re-used once the e-liquid has run out. Disposable e-cigarettes can have a dangerous dose of nicotine or other drugs.
- **Electronic Cigarette:** A battery-powered device that heats an e-liquid to make an aerosol that is inhaled. It may also be called an e-cigarette, vape, or Electronic Nicotine Delivery System (ENDS).
- **E-liquid:** The liquid that is heated inside e-cigarettes. The main ingredient is usually propylene glycol (PG) or vegetable glycerin (VG). Most e-liquids also contain flavorings and nicotine.
- **Flavoring Chemicals:** Chemicals that are added to e-liquid to make it taste like something else. While artificial flavors are safe to eat, they can be toxic when inhaled.

- **Nicotine:** A highly addictive drug found in tobacco leaves, cigars, cigarettes and nearly all e-liquids. Once someone is addicted to nicotine, it can be very difficult to stop using it.
- **Propylene Glycol & Vegetable Glycerin:** Chemicals in e-liquid that makes the smoke-like aerosol when heated and exhaled by a user.
- **Second-Hand Aerosol:** the aerosol from heated e-liquid that has been exhaled, or breathed out, by the person vaping and could potentially be inhaled by someone else who is not vaping.
- **Toxic:** containing poisonous material that causes sickness. E-cigarettes are toxic because there are many carcinogens (cancer-causing toxins) that can be created when an e-cigarette heats the e-liquid, including formaldehyde and heavy metals.
- **Vaping:** the act of using, smoking, or puffing an e-cigarette.
- **Vapor:** a mixture of a certain substance in both its gas and liquid phase that suspends (floats) in air when it is heated.

## Slide 2 | Agenda

- Open the lesson by quickly reviewing the agenda of activities for the session and the homework assignment if you choose to use it.
  - **Teacher Note:** *The times displayed are simply suggested times. Please adjust accordingly for your classroom.*

## Slide 3 | Opening Question

- Display the question “If someone tells you to ‘make good choices’ what do you think they mean?” on the board while you get ready to start class. Have students think about the question or jot down their responses on scratch paper/the back of their worksheet.
  - **Teacher note:** *The Opening Question is included so that students can quickly engage with the content while you complete beginning-of-class tasks like taking attendance and collecting homework. You can also simply use it to start the lesson if that fits your classroom structure better.*

## Slide 4 | Decisions

- Choose a few student volunteers to share their responses from the Opening Question.
- Tell students that, as they get older, they’ll probably be allowed to make more and more decisions on their own. Ask them if they think they can make the best decisions and what they think affects or influences those decisions. Tell them that knowing what affects their decisions can help them make the best possible decisions for themselves.
- Tell students that some people—even adults—make all their decisions in the same way whether it’s a big or small decision. As we learn and grow, however, we often find it necessary to think more about big decisions.
- Click and instruct students to look at the examples on the slide. Ask students whether each is a big or small decision and take a volunteer to answer for each example. After each response, ask why they thought it was a big/small decision, guiding them to the idea that big decisions potentially have bigger consequences in life.

- **Teacher note:** *Numbers one and three are meant to be the small decisions and two and four the big decisions. If you have other examples you think would be more suitable to your class, please substitute those in.*

- Remind students that small decisions don’t need a lot of thought because they usually do not have big consequences. Do you want to wear red or blue today? What outfit should I wear? Other decisions that have the potential of affecting their life should involve a little more thought. Should you try out for the team? Should you try to go on the big trip or not?

### KEY TALKING POINTS

- **Big decisions require more thought because they usually affect our lives in a big way.**

## Slide 5

- Have students think-pair-share their thoughts for the question on the screen: “What would you want to know/do before making a big decision?” Prompt them to think about the big decision examples from the previous slide if they get stuck.
  - **Teacher note:** *If you haven’t used think-pair-share before, here is a quick explanation: After presenting the question, give students about 20 seconds to think quietly about it. Then, have the students turn to a partner and discuss their thoughts. Afterwards, call on a few students/volunteers to share what their pair discussed.*
- Students will likely say that they want to know more information about the possible

effects/outcomes of their decision. Be sure to emphasize/mirror their point: "You want to know more information about the effects of your decision."

- If no one said they'd want to find out what their friends/family would think, ask: "Do you think that you'd want to hear what your family would say about it? Would your friends' decisions affect yours?"
- Click to make the green box with the key point appear and have a student read the key point.

#### KEY TALKING POINTS

- It is helpful to know about the potential effects of our choices before making a big decision.

## Slide 6 | Big Decisions

- Ask students the question on the slide: "Is the choice to use or not use tobacco products, including e-cigarettes, a big or small decision?" Let students think about it for a few seconds and then take responses. Remind them to reference the "big decision" criteria of having big potential effects on their lives.
  - **Teacher note:** If you have a student say it's not a big decision, simply let them know that they're going to learn a lot about these products during the four sessions. By the end, they'll have more information to make that determination.

#### KEY TALKING POINTS

- The choice of whether or not to use tobacco products, including e-cigarettes, is a big decision that requires a lot of thought because it affects your life in a big way.

## Slide 7 | Curriculum Introduction

- Say: "Today, we're starting a program called *CATCH My Breath*. Like many of you said, the choice of whether or not to use tobacco products, including e-cigarettes/vapes, is a big decision. In order to make that decision, we're going to make sure that you have the right information and the time to really think about it. While our program covers lots of tobacco products, we are focusing on e-cigarettes/vapes because they are newer, meaning lots of people don't know all the facts about them."
- Have student volunteers read through the program objectives on the slide.
- Tell students that there will be some additional classroom rules/norms during these sessions in order to get the most out of the lessons.
  - **Teacher note:** Feel free to skip this slide if it doesn't work in your classroom. Other teachers have also used this slide to review some existing classroom norms that have been some trouble spots for the class.
- First, there are "No Bad Questions." Remind students that e-cigarettes are new and there is a lot of misinformation out there. It's ok to not know everything.



- Second, "Respect Others' Privacy." Remind students that they may be talking about private things or telling sensitive stories, so it's important not to use people's names in those stories and not to share other people's stories.

## Slide 8 | True or False?

- Remind the students that they want to know the possible effects of a decision before making that decision. Let them know when it comes to tobacco products there is a lot of misinformation that may make it hard to make the right decisions for themselves. In fact, some people may be making decisions on false information. Tell students that they are going to check what they think they already know about e-cigarettes.
- Distribute one copy of **Activity 1a: Understand the Choice** to each student. In the top section of the worksheet, there is a list of statements (also listed below) about tobacco products and e-cigarettes. Some statements are true and some are false. On their own, students should write their guess in the left-hand column. Tell them that the answers to these statements will come up during the lesson and they'll have a chance to check their answers at the end of class. Be sure not to reveal the answers until the end of the lesson.
- **Activity 1a: Understand the Choice:**  
Worksheet Statements:
  - The "cloud" from an e-cigarette is water vapor.
  - Some e-cigarettes are safe.
  - Most e-cigarettes contain nicotine, the addictive chemical found in other tobacco products.
  - You have to be at least 18 years old to buy or use tobacco products.

- Nicotine harms healthy growth and development of the brain.
- Fruit, mint, and candy flavored e-cigarettes are less dangerous than tobacco flavored e-cigarettes.
- You can't get addicted to nicotine unless you use it every day.

## Slide 9 | Aerosol not Vapor

- Tell students that you're going to start by learning the very basics about e-cigarettes. Tell them that many people refer to e-cigarettes as 'vapes' and using e-cigarettes as 'vaping'.
- Ask students what they think of when they hear the word 'vapor'. Many students will say 'water' or 'a gas.'
- Click to reveal the image of the tea kettle.
- Click again to share the fact that e-cigarette 'vapor' is NOT water vapor. E-cigarette 'vapor' is really an aerosol.
- Ask students what they think of when they hear the word 'aerosol'. Many will think of spray cans like room fresheners or spray paint.
- Click to reveal the image of the spray can.
- Explain to students that an aerosol is a suspension of tiny particles of liquid, solid, or both within a gas as opposed to water vapor, which is a water in its gaseous phase. Inhaling the aerosol of e-cigarettes is not safe. It may cause short-term issues with your breathing, lungs, and nose/mouth and is linked to long-term consequences like heart disease.<sup>8</sup>

<sup>8</sup> <https://www.lung.org/assets/documents/stop-smoking/e-cigarettes-teens.pdf>



**KEY TALKING POINTS**

- E-cigarette ‘vapor’ is NOT water vapor. It is made up of tiny particles containing nicotine and toxic chemicals.<sup>8</sup>
- Inhaling the aerosol of e-cigarettes is not safe. It can cause short term issues with your breathing, lungs, and long-term consequences like heart disease and cancer.<sup>8</sup>

**Slide 10 | E-liquid Ingredients**

- Tell students that they’re going to learn what’s actually in e-cigarette aerosol now that they know that it’s not just harmless water vapor.
- Whether it’s in a refillable tank, a pod, a bottle of e-liquid, or a disposable vape, nearly all e-cigarettes have some of the same basic ingredients: vegetable glycerin /propylene glycol, nicotine, and flavoring chemicals.<sup>9</sup>
- Click to reveal the arrows pointing to **vegetable glycerine and propylene glycol**. These two ingredients are used in e-liquids to carry the other ingredients as well as to make the ‘smoke’ or ‘cloud’ that you see when someone vapes. Both have been tested and shown as safe to ingest but have not been approved to be vaporized and inhaled.
- Heating and inhaling vegetable glycerin and/or propylene glycol are known to cause problems in your respiratory system (nose, mouth, throat, lungs). This means there are no safe e-cigarettes.
- Click to reveal the arrow pointing to **nicotine**. The CDC reports that 99% of e-cigarettes contain nicotine, even some that claim that they have none.<sup>9-12</sup>

- Nicotine is the drug found in tobacco products that makes them addictive. That means that once you use it, your brain will continue to want more. When you use e-cigarettes, nicotine is quickly absorbed into your body and goes to your brain. Putting nicotine in your body is dangerously addictive, and it can also change your brain in a way that you are more likely to get addicted to other substances like drugs and alcohol. The CDC reports that 99% of e-cigarettes contain nicotine, even some that claim they have none. This means there are no safe e-cigarettes.
- Click to reveal the arrow for **flavoring chemicals**. Tell students that e-cigarette companies also usually include flavoring chemicals in their products. Flavoring chemicals are added to e-juice to make it taste like something else and cover up the taste of the other ingredients. Flavors are also used to attract new users.<sup>13</sup>
- Inform students that, while some of these flavoring chemicals may be safe to ingest, some can be very harmful or even toxic when vaporized and inhaled.
- Click to reveal the **‘no water’** symbol and remind students there is absolutely NO water in e-cigarette liquid.

8 <https://www.lung.org/assets/documents/stop-smoking/e-cigarettes-teens.pdf>

9 [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)

10 <https://truthinitiative.org/research-resources/emerging-tobacco-products/lot-youth-think-they-arent-vapingnicotinetruer/#targetText=Ninety%2Dnine%20percent%20of%20e.for%20Disease%20Control%20and%20Prevention>

11 Marynak, K. L., Gammon, D. G., Rogers, T., Coats, E. M., Singh, T., & King, B. A. (2017). Sales of Nicotine-Containing Electronic Cigarette Products: United States, 2015. *American journal of public health, 107*(5), 702–705. doi:10.2105/AJPH.2017.303660

12 Wang, T. W., Trivers, K. F., Marynak, K. L., O’Brien, E. K., Persoskie, A., Liu, S. T., & King, B. A. (2018). Harm perceptions of intermittent tobacco product use among US youth, 2016. *Journal of Adolescent Health, 62*(6), 750–753.

13 <http://dx.doi.org/10.15585/mmwr.Ss6812a1>

**KEY TALKING POINTS**

- The CDC reports that 99% of e-cigarettes contain nicotine, even some that claim they have none.<sup>9-12</sup>
- Many chemicals found in e-liquid have been studied and shown safe to ingest, but not to inhale.
- There is no water in any e-cigarette liquid.

**Slide 11 | More Ingredients than E-juice**

- Explain to students that liquid e-juice must be heated in order to be inhaled as an aerosol. When that happens, chemical reactions occur that create new chemicals.
- The chemicals also touch a hot coil and other parts of the device that can leak heavy metals into the aerosol.
- The chemicals on the screen are just a few examples of chemicals that are created or come off the coil.

**KEY TALKING POINTS**

- When someone inhales e-cigarette vapor, they are inhaling more than the ingredients in the e-juice. They are also inhaling new chemical compounds that formed when the liquid was heated and/or chemicals that have come off the inside of the e-cigarette device.<sup>14,15</sup>

**Slide 12 | Heavy Metal Video**

- Click to play the video [Do Vapes Contain Toxic Metals? The Real Cost.](#)<sup>16</sup>
- Remind students that when someone uses an e-cigarette, they are not inhaling harmless water vapor. They are inhaling toxic chemicals and tiny particles of heavy metal into their lungs as shown in the video. These substances can get stuck in the lungs and cause damage in the respiratory system and throughout the body.

**Slide 13 | Peer Groups**

- Divide students into their peer groups and identify the peer group facilitators (PGF) as described in Session O.

**Slide 14 | Aerosol Analysis**

- Remind students that e-cigarettes contain harmful chemicals and do not contain ANY water. They'll now have the opportunity to learn more about what's actually in the aerosol and how those substances affect the body and mind.
  - **Teacher note:** As described in the Educator Prep section, be sure to hang

9 [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)

10 <https://truthinitiative.org/research-resources/emerging-tobacco-products/lot-youth-think-they-arent-vaping-nicotine-true/#targetText=Ninety%2Dnine%20percent%20of%20e.for%20Disease%20Control%20and%20Prevention>

11 Marynak, K. L., Gammon, D. G., Rogers, T., Coats, E. M., Singh, T., & King, B. A. (2017). Sales of Nicotine-Containing Electronic Cigarette Products: United States, 2015. *American journal of public health, 107*(5), 702-705. doi:10.2105/AJPH.2017.303660

12 Wang, T. W., Trivers, K. F., Marynak, K. L., O'Brien, E. K., Persoskie, A., Liu, S. T., & King, B. A. (2018). Harm perceptions of intermittent tobacco product use among US youth, 2016. *Journal of Adolescent Health, 62*(6), 750-753.

14 Cheng, T. (2014). Chemical evaluation of electronic cigarettes. *Tobacco control, 23*(suppl 2), ii11-ii17.

15 <https://doi.org/10.1371/journal.pone.0057967>

16 [https://www.youtube.com/watch?v=q3r\\_Y9MWNDs&feature=emb\\_err\\_woyt](https://www.youtube.com/watch?v=q3r_Y9MWNDs&feature=emb_err_woyt)

*up the Organ Posters before the activity. Alternatively, you can write the names of these organs on butcher paper/the board and have kids write/place notes underneath each organ name.*

- Distribute one **Activity 1b: Aerosol Analysis worksheet** and pad of sticky notes to each group. Assign each group to one of the chemical categories from the handout: Toxicants<sup>48-50</sup>, Flavor Chemicals<sup>51-53</sup>, Carcinogens<sup>54-56</sup>, Heavy Metals<sup>57,58</sup>, Volatile Organic Compounds<sup>56,59</sup>.
- Read the directions and instruct students to begin working.
- In their groups, students should read about the substance, looking for the health effects on different parts of their bodies. The groups will use the sticky notes to write the effect that chemical category has on the different body parts. For example, they may write "Nicotine can make you moody" on a sticky note and then they stick that up on the picture/sign for the brain.
- We recommend giving students about 5 minutes to complete this portion of the activity.
- Once time is up or most groups look like they're done posting their notes, tell students that they will be doing a brief gallery walk to see all the effects of e-cigarettes on the body. Instruct them to browse the posters/signs around the room with their group and discuss their reactions quietly.
- To provide some more structure, you can assign each group a poster and instruct them to gather around that poster. After one minute, signal to the students to switch to the next poster. Repeat until all groups have seen all posters and then instruct students to return to their group's table.
  - **Alternate:** *If you don't think a gallery walk will work in your classroom set-up, you can also have a volunteer go up to each poster and read out some of the effects that were posted.*

- Once students have returned to their seats, ask for a few volunteers to share what information surprised them the most.

## Slide 15 | NOT Harmless

- Show students the key points about what they learned in their gallery walk. Read the bullet points from the slide or choose student volunteers to do it.

48 <https://pubchem.ncbi.nlm.nih.gov/compound/Nicotine#datasheet=LCSS>

49 Blount BC, Karwowski MP, Shields PG, et al. Vitamin E acetate in bronchoalveolar-lavage fluid associated with EVALI. *N Engl J Med*. 2020;382(8):697-705.

50 <https://aapcc.org/track/ecigarettes-liquid-nicotine>. Accessed July 28, 2020

51 U.S. Environmental Protection Agency. (1985). Health And Environmental Effects Profile for Benzaldehyde. U.S. Environmental Protection Agency, Washington, D.C., EPA/600/X-85/395 (NTIS PB88174537).

52 Allen JG, Flanigan SS, LeBlanc M, et al. Flavoring chemicals in E-cigarettes: Diacetyl, 2,3-pentanedione, and acetoin in a sample of 51 products, including fruit-, candy-, and cocktail flavored E-cigarettes. *Environ Health Perspect*. 2016;124(6):733-739.

53 Czoli CD, Goniewicz ML, Palumbo M, Leigh N, White CM, Hammond D. Identification of flavouring chemicals and potential toxicants in e-cigarette products in Ontario, Canada. *Can J Public Health*. 2019;110(5):542-550.

54 Goniewicz ML, Knysak J, Gawron M, et al. Levels of selected carcinogens and toxicants in vapour from electronic cigarettes. *Tob Control*. 2014;23(2):133-139.

55 <https://www.lung.org/assets/documents/stop-smoking/e-cigarettes-teens.pdf>. Accessed on May 18, 2020

56 Samburova V, Bhattarai C, Strickland M, et al. Aldehydes in exhaled breath during E-cigarette vaping: Pilot study results. *Toxics*. 2018;6(3). doi:10.3390/toxics6030046

57 Järup L. Hazards of heavy metal contamination. *Br Med Bull*. 2003;69(1):167-182.

58 Azeh Engwa G, Udoka Ferdinand P, Nweke Nwalo F, N. Unachukwu M. Mechanism and health effects of heavy metal toxicity in humans. In: *Poisoning in the Modern World - New Tricks for an Old Dog?*. IntechOpen; 2019.

59 <https://www.epa.gov/indoor-air-quality-iaq/volatile-organic-compounds-impact-indoor-air-quality>



### KEY TALKING POINTS

- Like regular cigarettes, e-cigarettes contain nicotine. Nicotine is addictive and toxic, especially for young people.
- E-cigarette aerosol has tiny particles of heavy metal and other chemicals that make it harmful to many parts of your body.
- E-cigarettes are not safe to use, especially for people your age. They may be a safer alternative for adults who quit tobacco smoking but any form of tobacco, including e-cigarettes, are not safe.
- There is no such thing as a safe e-cigarette.

- According to 2017 global estimates, 99 billion pounds of e-waste (from computers, phones, tablets, and now e-cigarettes) are discarded annually. With a slogan like Puff Bar's—"Open. Use. Throw Away."—it's no surprise that much of this waste created by e-cigarettes comes from disposable devices.<sup>17</sup>

### KEY TALKING POINTS

- E-cigarette batteries can be toxic to the environment.
- Some e-cigarettes have enough levels of toxic chemicals to qualify as hazardous waste.
- E-cigarettes contribute to the 99 Billion pounds of electronic waste each year.

## Slide 16 | Environmental Effects

- Explain to students that, in addition to harming their bodies, e-cigarettes are also harmful to the environment.
- E-cigarette batteries can be toxic to the environment if not disposed of properly and the lithium batteries inside are a fire hazard. In order to properly recycle e-cigarettes, the batteries must be separated from the device by an outside service professional. Encourage students to talk to an adult about disposing of and/or recycling e-cigarette devices and vaping-related items if found.<sup>17-19</sup>
- Let them know that some e-cigarettes contain enough toxic chemicals to qualify as hazardous waste. Broken devices can leak heavy metals (including mercury, lead, and bromine), battery acid, and nicotine into the local environment, affecting humans and other organisms.<sup>17</sup> For this reason, if you do see a broken device or pod laying around, let an adult know about it and don't touch it/ move it without gloves.

## Slide 17 | Laws & Rules

- Inform students that there are laws and rules in place to protect them from harmful e-cigarettes. In December 2019, the Federal Food, Drug and Cosmetic Act was amended, raising the minimum age to purchase tobacco products from 18 to 21 years across the United States.
- It is now illegal for a retailer to sell any tobacco product—including e-cigarettes—to anyone under 21.
  - **Teacher Note:** *If a student asks about exemptions, you can inform them that the law applies to everyone in the US including people in the military and those living on Native American reservations.*

<sup>17</sup> <https://doi.org/10.2105/AJPH.2018.304699>

<sup>18</sup> <https://www.wbay.com/content/news/WARNING-This-iswhy-you-should-dispose-of-your-lithium-batteriesproperly-461400593.html>

<sup>19</sup> <https://abcnews.go.com/Politics/cigarettes-highlight-challengesdealing-plastic-waste/story?id=68890487>

### KEY TALKING POINTS

- As of December 31, 2019, it became illegal to sell any tobacco product—including e-cigarettes—to anyone under 21 everywhere in the United States.

## Slide 18

- Share your school code of conduct and district policy about tobacco and e-cigarettes as well as any consequences the students might incur if they use, possess, or sell e-cigarettes or other tobacco products on school property.
  - **Teacher Note:** *If queried by students regarding marijuana or THC vape vapes, consult your school resource officer (SRO) to learn more about your area's policies and regulations.*

### KEY TALKING POINTS

- It is against school rules for you to possess, use or sell any tobacco product, including cigarettes, cigars, or e-cigarettes on campus. There are consequences for using tobacco products on school grounds.

## Slide 19 | Consequences

- Distribute one index card or square of paper to each student. Instruct students to talk within their group and write down the negative consequences of using e-cigarettes.
- Prompt students to list consequences beyond the health effects. For example, they can think about the financial costs or the social consequences if their parents, friends, school or coaches knew they used e-cigarettes. If they get stuck, prompt them to think about the extra questions listed on the screen.
- Give students about 4 minutes to think, discuss, and write. If they get stuck, prompt them to think about the extra questions on the screen. After the students are done writing, have them discuss what they wrote with their group.
  - **Teacher Note:** *if you need help answering legal questions about your state, you can visit [Public Health Law Center's 50 State Review](#).<sup>20</sup>*

## Slide 20 | My Vaping Mistake Video

- Explain to students that you're about to show a video where young people talk about their real-life experiences after they made the choice to use e-cigarettes. Instruct students to write any additional negative consequences on their note cards that they didn't already write down during or after the video.
- Click to play the video: [My Vaping Mistake: How it affected my relationships](#)<sup>21</sup>

<sup>20</sup> <https://publichealthlawcenter.org/resources/us-ecigarette-regulations-50-state-review>

<sup>21</sup> [https://www.youtube.com/watch?v=adwJvS6NBcM&feature=emb\\_logo](https://www.youtube.com/watch?v=adwJvS6NBcM&feature=emb_logo)

## Slide 21

- Ask each group to share a few consequences from different categories.
- Click to reveal a list of common responses, reinforcing the ones that students come up with and pointing out new ones.
  - **Teacher note:** *If you have the time, it's preferable to write up the consequences that students share or have them write them up themselves without seeing the pre-populated list. This allows the students to have more ownership of the list but takes more class time than what has been allotted.*

### KEY TALKING POINTS

- There are short- and long-term consequences of e-cigarette use to your health, social life, values, and goals.

## Slide 22 | Evaluate

- Instruct students to look at the statements on **Activity 1a: Understand the Choice** and their responses from the beginning of class. Remind them that they've learned a lot in just this one session and they may want to change their answers. Instruct them to write down "T" for "True" and "F" for "False" on the right column of their worksheet, armed with their new knowledge.
- Ask a volunteer to give their response to each statement to say whether they think the statement is true or false. Reveal the answers to the students and prompt them to make sure their answers are correct. See the answers below and correct statements:

1. The "cloud" from an e-cigarette is water vapor.  
**False—Correction:** The "cloud" from an e-cigarette is a harmful aerosol.<sup>8</sup>
2. Some e-cigarettes are safe.  
**False—Correction:** There is no such thing as a safe e-cigarette.<sup>8</sup>
3. Most e-cigarettes contain nicotine, the addictive chemical found in other tobacco products.  
**True—Extension:** 99% of e-cigarettes contain nicotine.<sup>9-12</sup>
4. You have to be at least 18 years old to buy or use tobacco products.  
**False—Correction:** You have to be at least 21 years old to buy tobacco products.<sup>20</sup>
5. Nicotine harms healthy growth and development of the brain.  
**True—Extension:** Nicotine harms healthy growth and development of the brain, especially in young people.<sup>9, 10</sup>
6. Fruit, mint, and candy flavored e-cigarettes are less dangerous than tobacco flavored e-cigarettes.  
**False—Correction:** Fruit, mint, and candy flavored e-cigarettes are just as dangerous as tobacco-flavored e-cigarettes.<sup>9, 10</sup>

8 <https://www.lung.org/assets/documents/stop-smoking/e-cigarettes-teens.pdf>

9 [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)

10 <https://truthinitiative.org/research-resources/emerging-tobaccoproducts/lot-youth-think-they-arent-vapingnicotinetruer##targetText=Ninety%2Dnine%20percent%20of%20e.for%20Disease%20Control%20and%20Prevention>

11 Marynak, K. L., Gammon, D. G., Rogers, T., Coats, E. M., Singh, T., & King, B. A. (2017). Sales of Nicotine-Containing Electronic Cigarette Products: United States, 2015. *American journal of public health*, 107(5), 702-705. doi:10.2105/AJPH.2017.303660

12 Wang, T. W., Trivers, K. F., Marynak, K. L., O'Brien, E. K., Persoskie, A., Liu, S. T., & King, B. A. (2018). Harm perceptions of intermittent tobacco product use among US youth, 2016. *Journal of Adolescent Health*, 62(6), 750-753.

20 <https://publichealthlawcenter.org/resources/us-ecigarette-regulations-50-state-review>



7. *You can't get addicted to nicotine unless you use it every day.*  
**False—Correction:** You can get addicted to nicotine even if you are not using it every day.<sup>9,10</sup>

## Slide 23 | Summary and Reflection

- Choose a few student volunteers to read out the key points of the lesson on the screen
  - Tell students that they will now have the chance to reflect privately about what they've learned. Instruct students to look at the big box underneath the True/False section of their **Activity 1a: Understand the Choice** worksheet where they will complete their reflection. Let them know that the reflection is just for them and you will not require anyone to share out their answer.
  - Give the students about 2 minutes to answer the questions on their paper:
    - **Consider what you thought about vaping before you came into class and what you think now. Have your thoughts and opinions changed?**
    - **If so, what changed your mind about vaping and what do you think now?**
    - **If your opinions about vaping stayed the same, what information supported your beliefs?**
  - When they are done, ask if there are any volunteers that want to share out and praise students for their learning. Do not require any student to share their personal thoughts. It's ok if no one wants to share.
  - Should you use this extension, distribute one copy of **Activity 1c: Session 1 Review** to each student. Consider using the worksheet as an Exit Ticket, Homework Assignment, or Quiz.
- **Exit Ticket:** Use the worksheet to check how well the students understood the lesson. Allow them to choose 2 of the 4 questions in each section or allow them to choose one section to complete.
  - **Homework:** Issue these options as homework. Announce it as an assignment and have them return it at the beginning of the next CATCH My Breath session.
  - **Quiz:** If you're looking for quiz or test questions, the worksheet can be used as a reference.
- Should you use the **parent info sheets**, distribute one to each student at this time and instruct them to bring it home to their parents.

9 [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)

10 <https://truthinitiative.org/research-resources/emerging-tobaccoproducts/lot-youth-think-they-arent-vapingnicotinetruerue##targetText=Ninety%2Dnine%20percent%20of%20e.for%20Disease%20Control%20and%20Prevention>

# Activity 1a:

## Understand the Choice

In the left column, write "T" for statements you think are True and "F" for statements you think are False. If you don't know, take a guess. At the end of class, you'll do the same on the right.

Start of Session	True/False Statement	End of Session
	1. The "cloud" from an e-cigarette is water vapor.	
	2. Some e-cigarettes are safe.	
	3. Most e-cigarettes contain nicotine, the addictive chemical found in other tobacco products.	
	4. You have to be at least 18 years old to buy or use tobacco products.	
	5. Nicotine harms healthy growth and development of the brain.	
	6. Fruit, mint and candy flavored e-cigarettes are less dangerous than tobacco flavored e-cigarettes.	
	7. You can't get addicted to nicotine unless you use it every day.	

### END OF CLASS ACTIVITY:

Consider what you thought about vaping before you came into class and what you think now. Have your thoughts and opinions changed?

If so, what changed your mind about vaping and what do you think now? If your opinions about vaping stayed the same, what information supported your beliefs?

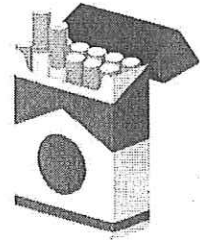
# Activity 1b: Aerosol Analysis

E-cigarette 'clouds' are not harmless water vapor. Scientific studies have identified hundreds of chemicals in the e-cigarette aerosol which is inhaled by the user and could also be inhaled by people nearby as second-hand aerosol.

1. Read the following information about the chemicals in e-cigarette aerosol.
2. As a group, record the chemicals' effects on different sticky notes.
3. Post your sticky notes next to the appropriate organ poster/sign.

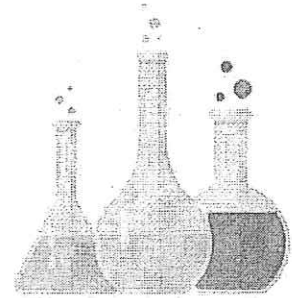
**Toxicants (e.g. Nicotine): Toxicants are substances found in nature that can be toxic to the body when inhaled or ingested. Nicotine is considered a severe toxicant and psychoactive substance.**

- **Nicotine** is the highly-addictive drug found in tobacco leaves, cigarettes, and most e-liquids. It changes the brain causing addiction, depression, and anxiety.
- Nearly all e-liquids contain nicotine, even some that claim they don't.
- Nicotine overdose symptoms include vomiting, diarrhea, dizziness, uncontrolled shaking, rapid heart rate, seizures and even death.
- E-liquids with nicotine can be deadly if swallowed. Since 2013, there have been over 25,000 poison control center cases related to e-liquid; most were children.



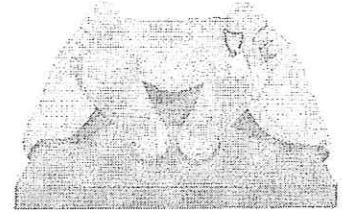
**Flavor Chemicals (e.g. Diacetyl, Cinnamaldehyde, Benzaldehyde): Flavor chemicals are substances added to hide the taste of e-cigarette aerosol to make it more appealing and to attract young users. There are more than 8,000 flavors and thousands more flavor chemicals being used in e-liquids.**

- Flavor Chemicals often irritate the nose and throat causing coughing, wheezing, and shortness of breath.
- When **diacetyl** is regularly inhaled, it causes a condition known as 'popcorn lung' which scars your lungs and is potentially fatal.
- **Diacetyl (butter)** and **cinnamaldehyde (cinnamon)** are two examples of flavor chemicals that have known harmful effects on the lungs, but e-cigarette companies used them anyway. While some companies still choose to ignore this information, others removed the chemicals from their products. If stronger regulation isn't in place or companies choose to ignore known side-effects, what else could be included in e-juice?



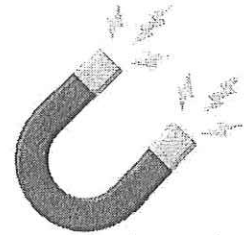
**Carcinogens** (e.g. Formaldehyde): **Carcinogens are substances that are known to cause cancer.**

- **Formaldehyde** is a by-product created when e-liquid is heated. It is also found in glue, concrete, nail polish, and the embalming fluid used to preserve dead bodies.
- Inhaling formaldehyde can make you feel sick, causing symptoms like sore throat, cough, scratchy eyes, and nosebleeds. It's also known to cause cancer, particularly of the nose and throat.
- Formaldehyde may also cause birth defects and damage to the liver, kidneys, brain, and spinal cord.



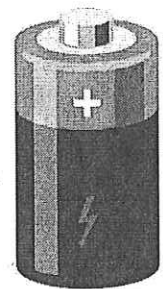
**Heavy Metals** (e.g. Nickel, Tin, Lead): **Heavy metals are created when e-liquid is heated or leaked from inside the device. Heavy metals have a very high density and are highly toxic to humans.**

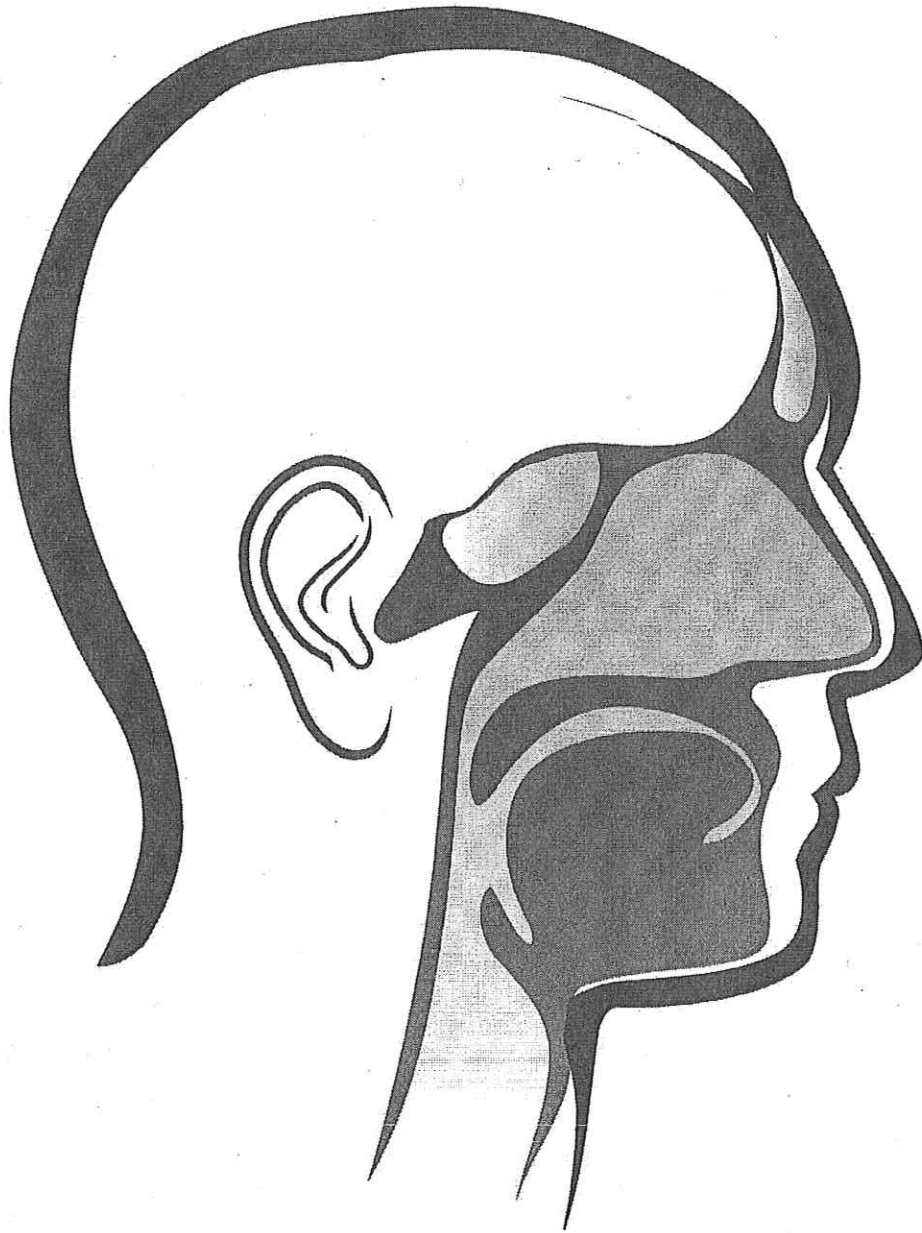
- Heavy metal poisoning affects many organs in the body. Side effects include stomach cramps, headache, kidney disease, and bone damage.
- They can also cause neuropathy (brain dysfunction/disease) such as reduced intelligence, decreased memory, and brain cancer.
- Heavy metals are found in magnets, bullets, coins, and batteries.



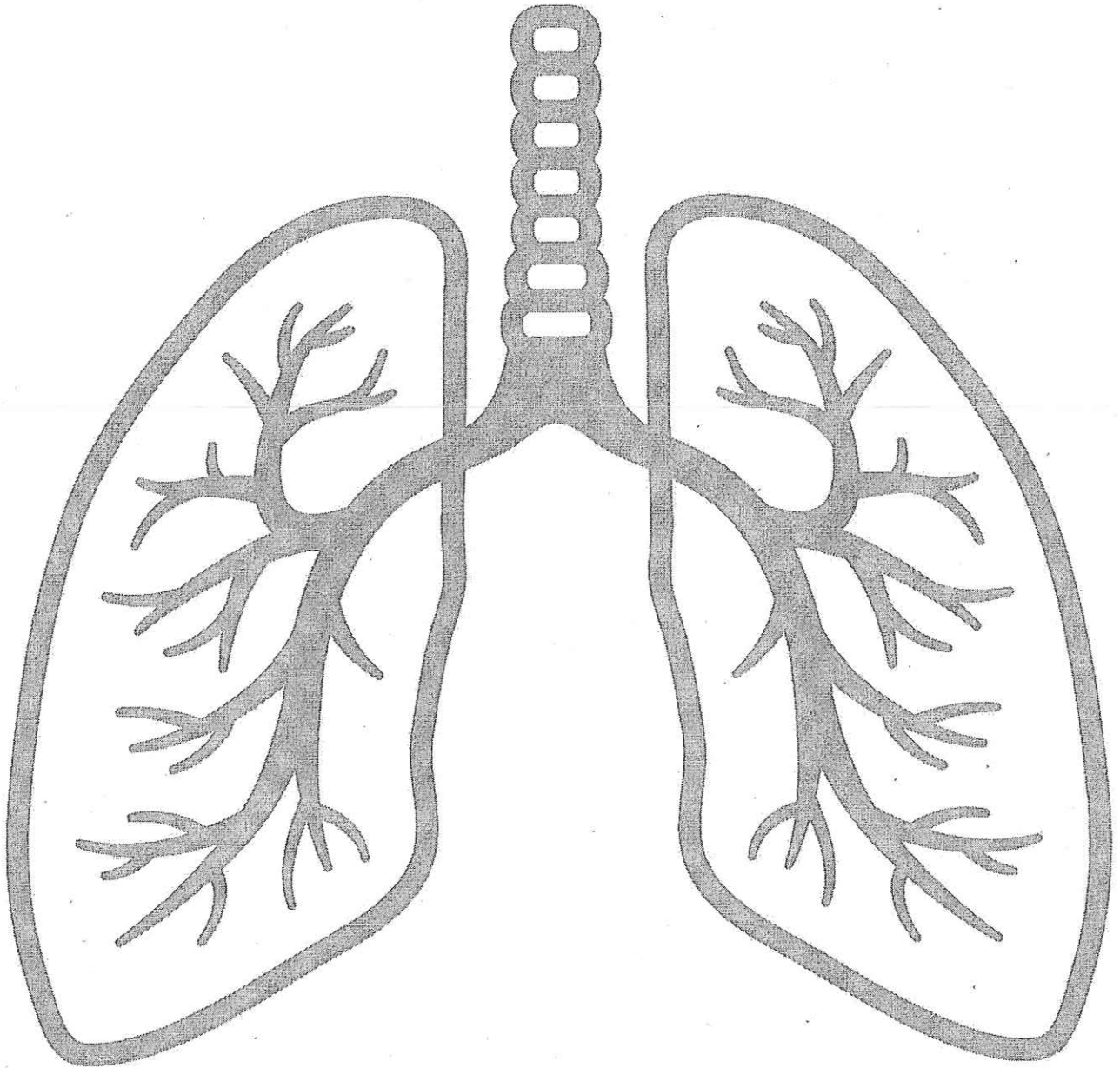
**Volatile Organic Compounds** (e.g. Cadmium, Acrolein): **Volatile organic compounds (VOCs) are created when e-liquid is heated. VOCs are gases that leak from certain solids or liquids. VOCs include a variety of chemicals, many of which may have negative health effects.**

- Breathing **acrolein** for even a short time can cause eyes to water and a sore nose/throat. Long-term exposure at high levels is severely toxic to the lungs and can be fatal.
- Acrolein has been found in chemical weapons and is linked to lung cancer.
- When **cadmium** dust is inhaled, it causes dryness of the throat, choking, headache, and pneumonia-like symptoms. Cadmium is often found in batteries.



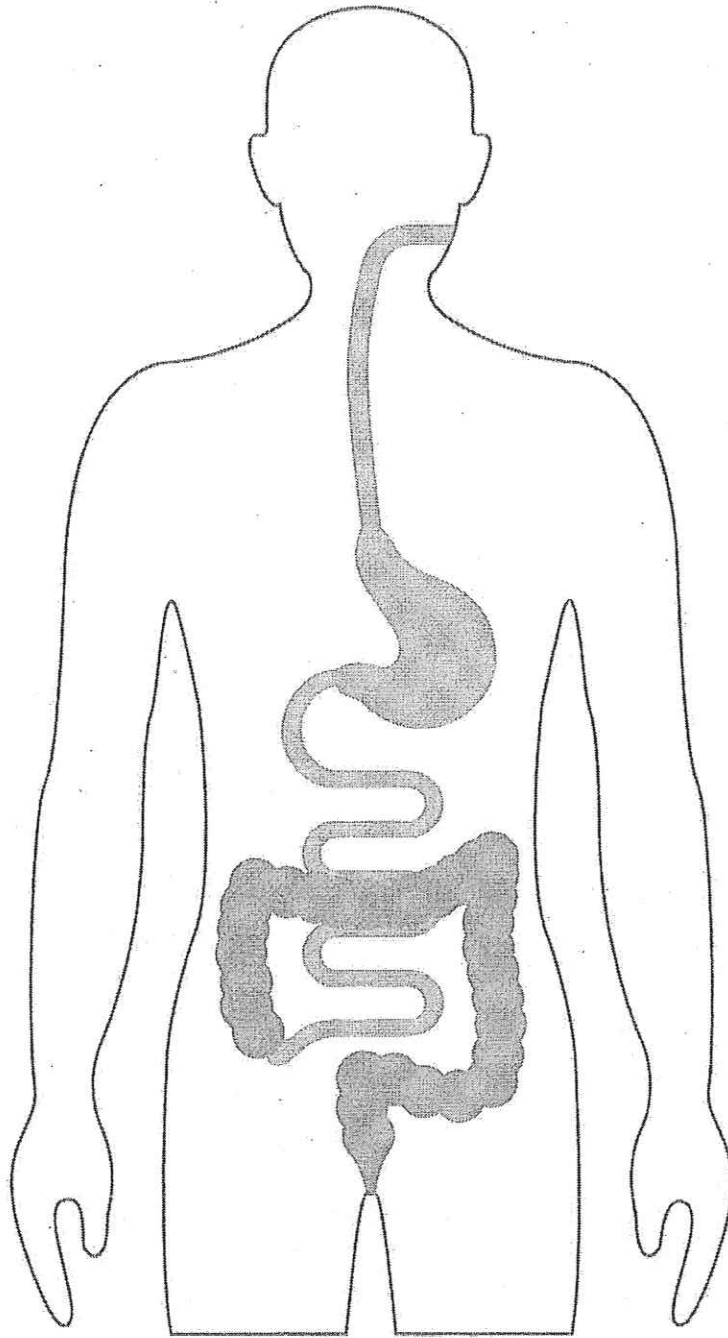


# MOUTH / NOSE / THROAT

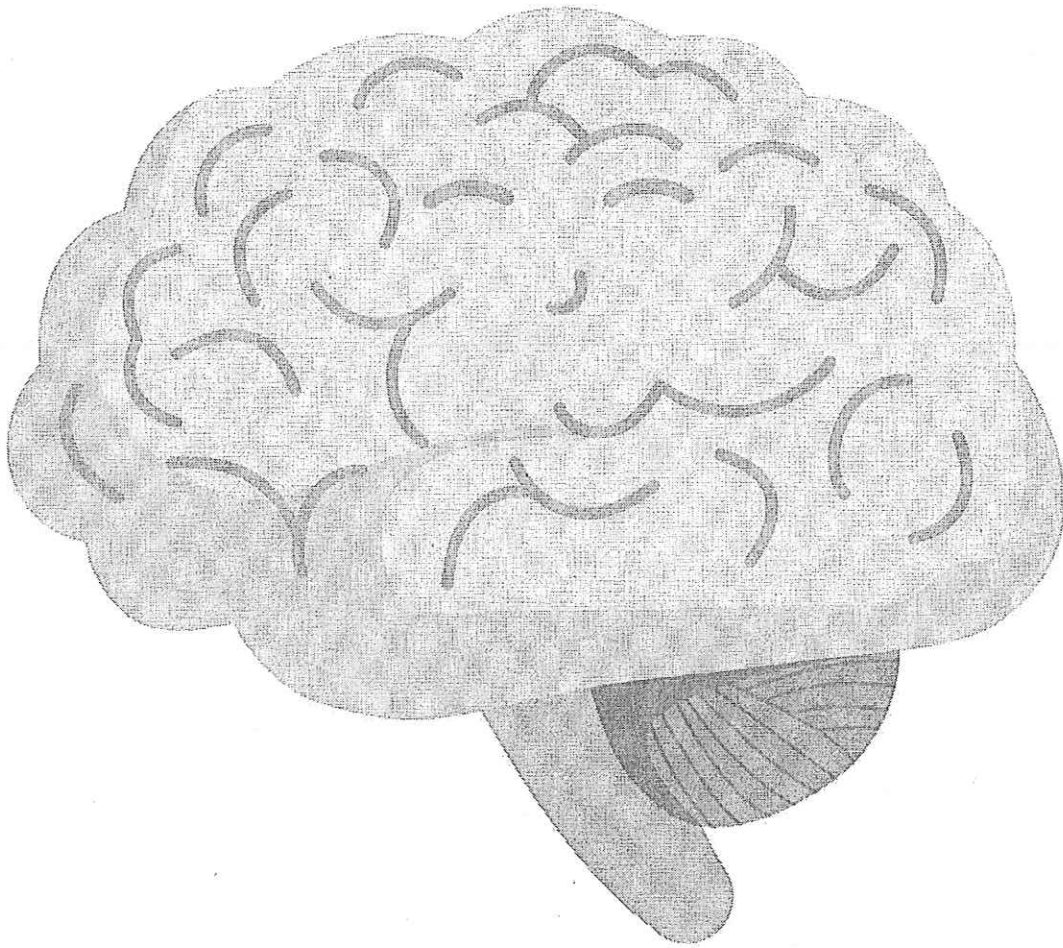


# LUNGS





# DIGESTIVE SYSTEM



# BRAIN