CATCH® MY BREATH

Virtual Field Trip Educator Guide

ELEMENTARY SCHOOL (5) | MIDDLE SCHOOL (6–8)

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BE VAPE FREE | Discovery EDUCATION

Overview

The teen vaping epidemic exists in an ever-changing landscape. The coronavirus pandemic not only transformed where and how teens vape, but also increased the deadly risks involved with using it. For example, recent studies show that vaping is linked to a substantially increased risk of COVID-19 among teenagers and young adults.[1]

Throughout all of this uncertainty, one constant remains: vaping isn't safe. Although teens claim they hear this message frequently, do they truly understand what happens to their body after they take a puff? Are the consequences clear? This Virtual Field Trip aims to make sure they are!

Objectives

Students will:

- Identify common misconceptions about vaping.
- Distinguish between water vapor and vaping aerosol.
- Explain how e-cigarettes deliver addictive nicotine to the body and brain.
- Explore how young people are especially susceptible to the pressure to vape as well as to the negative effects of vaping on the developing body and brain.
- Understand the most common ingredients in e-liquid and the effects of each.

Materials

- **Predict & Confirm: The Effects of Vaping** capture sheet
- Spray bottle filled with clean water
- Aerosol hair spray can (containing propylene glycol, if possible)
- Cotton fabric, 2 pieces large enough to use for a demonstration
- 2 balloons for demonstration, optional
- Aerosol ingredients posters (1 each to be displayed)
- **What's in That Vape?** capture sheet
- **What's in That Vape?** answer guide

Key Vocabulary

- **E-Cigarette:** a battery-powered system that heats an e-liquid to make an aerosol that is inhaled. It may also be called an Electronic Cigarette, vape, or Electronic Nicotine Delivery System (ENDS).
- **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.
- **E-liquid:** slang term for the liquid in an e-cigarette; more often than not, it includes nicotine and chemicals for flavoring.
- **Vapor:** a mixture of a certain substance in both its gas and liquid phase that suspends (floats) in air when it is heated.
    - **Teacher note:** *e-cigarettes do not produce vapor.*
- **Aerosol:** the tiny particles or droplets that are inhaled and exhaled by an e-cigarette user after the flavored e-liquid is heated.
- **Vaping:** the act of using, smoking, or puffing an e-cigarette.

1 https://www.jahonline.org/article/S1054-139X(20)30399-2/fulltext

Before Activity

Before your students begin Virtual Field Trip, see what they already know about the effects vaping has on different parts of their developing bodies. Before the Virtual Field Trip begins, students will make predictions to activate their prior knowledge. Using the **Predict & Confirm: The Effects of Vaping** capture sheet they will verify their predictions and record information they learn that helps support whether vaping has negative effects on the three organs of focus: lungs, heart, and brain.

- Lungs ✔
- Heart ✔
- Brain ✔

Post-activities

Activity 1: Vapor vs. Aerosol Demonstration

To facilitate students' deeper understanding of the differences between vapor and aerosol, complete this two-part demonstration for the class. As an option, you may choose to use balloons instead of fabric, or ask students if they believe there will be a difference between the two.

Teacher Prep: Fill a spray bottle with water and obtain an aerosol hair spray can (containing propylene glycol, if possible). Cut 2 pieces of cotton fabric large enough to use for a demonstration. Assign two student volunteers, Student A and Student B, to support with the demonstrations.

Invite Student A to join you and inform the class that you just filled the spray bottle with clean water a few minutes prior.

- Ask the class,
    - **What do you think will happen when Student A sprays the contents of the bottle onto a piece of fabric?**
      (it will get wet).
      Invite Student A to spray the fabric to confirm.
- Ask Student A to report to the class whether they can detect any smell coming from the liquid in the bottle *(no)*.
- Ask the class,
    - **Do you believe there will be anything left on the fabric once it dries?**
      (no, it was only water).
      Confirm that what came out of the bottle contained only water molecules, so once it dries, nothing will be left on the fabric.
- Ask the class,
    - **Do you think it is safe for you to spray what is in the bottle into your mouth?**
      (yes, probably, etc.).

Remind students that "vapor" is a word that e-cigarette companies often use to describe what comes out of their product—hence the slang term "vaping." However, what really comes out of an e-cigarette is aerosol.

Invite Student B to join you and repeat the process above.

- Ask the class,
    - **What do you think will happen when Student B sprays the aerosol hair spray onto the fabric?**
      (it will get sticky, it will stay where it is, it will get hard, etc.)
      Read the list of chemicals contained in the hair spray and confirm that many of those chemicals will get left on the piece of fabric, so their predictions are most likely correct.
- Invite Student B to spray the fabric to confirm. Then, ask if they can detect a smell from the aerosol (yes).
- Hold the bottle up to your mouth and ask the class,
    - **Do you think it is safe for you to spray this into your mouth and swallow it?**
      (no, it's not water, there are chemicals, etc.).
      Reinforce that they are absolutely

correct that spraying an aerosol that contains toxic chemicals into their mouths is dangerous. In fact, a common ingredient in hairspray, propylene glycol, is one of the most common bases in e-liquid.

Remind students that despite being called "vaping," using an e-cigarette is actually inhaling aerosol that has many chemicals, including addictive nicotine, into the lungs. Invite students to brainstorm ideas on how they can communicate this reality to their peers to educate them on the risks of "vaping."

- Ask the class,
  - **Do you have any ideas about what you could change the name of this activity to make it more accurate (i.e., "aerosoling")?**

Activity 2: What's in That Vape?

Teacher Prep: Print and display the 4 aerosol ingredients posters. You can double the set if you need more stations for larger class sizes.

As students learned in the Virtual Field Trip, e-cigarettes are highly- engineered nicotine delivery systems designed to be as palatable and addictive as possible with little regard to the dangers imposed to their body and mind.

In this gallery walk, students will examine various ingredients found in e-liquid to determine if each is addictive, dangerous, appealing to youth, or not important. Using the **What's in That Vape?** capture sheet, students can record their answers as well as evidence to support their position. The **What's in That Vape?** answer guide can be used to facilitate.

In small groups or as a class, invite students to share their position on each potential ingredient and the evidence they found. If students have differing opinions, facilitate a productive and respectful discussion in which each is able to present their evidence and draw a conclusion.

Predict & Confirm: The Effects of Vaping

Before the Virtual Field Trip, consider the effects vaping might have on each part of your body. As you are watching, check your prediction and gather information to support the correct answer.

- If you think vaping has a positive effect, write +
- If you think vaping has a negative effect, write –
- If you think vaping does not have any effect, leave the box blank.

Body Part	My Prediction	Does Vaping Have a Negative Effect?	Information to Support
Lungs			
Heart			
Brain			

What's in That Vape?

After watching the Virtual Field Trip, travel the classroom on a gallery walk to consider each of the ingredients that you might find in e-liquid. For each, determine whether you think it is addictive, dangerous, appealing to youth, or not important. Place a check mark in the box(es) that reflect your opinion—you can check more than one box for each ingredient.

Use the information on each poster to record evidence to support your opinion.

Ingredient	Addictive?	Dangerous?	Appealing?	Not Important?	Evidence
Nicotine					
Flavoring					
Formaldehyde					
Propylene Glycol					

What's in That Vape?

ANSWER GUIDE

After watching the Virtual Field Trip, travel the classroom on a gallery walk to consider each of the ingredients that you might find in e-liquid. For each, determine whether you think it is addictive, dangerous, appealing to youth, or not important. Place a check mark in the box(es) that reflect your opinion—you can check more than one box for each ingredient. ✔

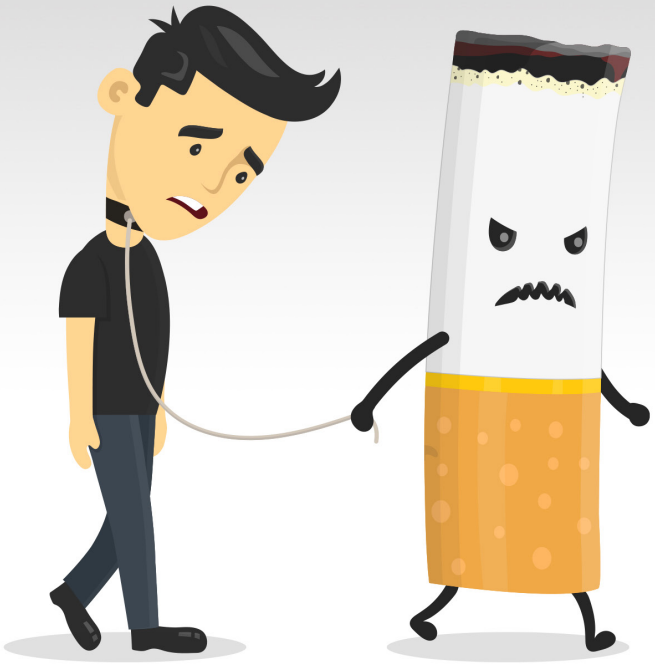
Use the information on each poster to record evidence to support your opinion.

Ingredient	Addictive?	Dangerous?	Appealing?	Not Important?	Evidence
Nicotine	✔	✔			• Highly addictive • Can harm brain development
Flavoring	✔*		✔		*Students may check "addictive" because over 99% of flavorings contain nicotine, which they have learned is addictive. • Kid-friendly flavors like cotton candy, bubblegum, and ice cream
Formaldehyde		✔			• Known carcinogen/causes cancer • Causes watery eyes, itching, nausea, and coughing • A chemical that isn't used in food
Propylene Glycol	✔	✔*		✔*	*Students may check "not important" because by itself, propylene glycol is not considered dangerous. *Students may check "addictive" because it mixes well with nicotine, which they have learned is addictive • Used as a base for dangerous chemicals.

What's in That Vape? Poster #1

Nicotine

Nicotine is a highly addictive substance found in the tobacco plant. Nicotine is in cigarettes and almost all e-cigarettes. Using Nicotine harms teen brain development.

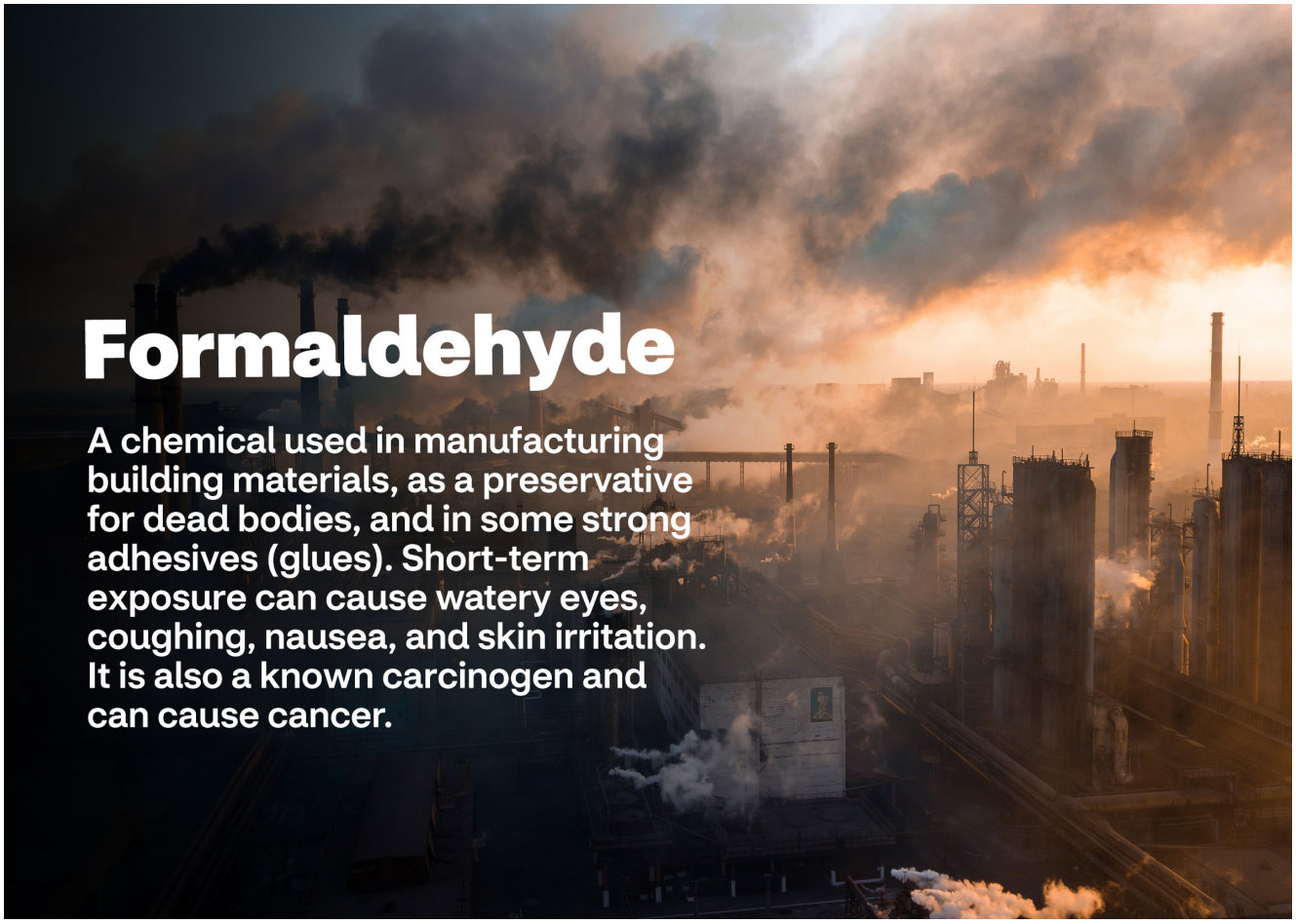


What's in That Vape? Poster #2

Flavorings

Over 99% of e-liquid on the market contains nicotine including flavored e-liquid. With sweet and fruity flavors, it's obvious that kids are being targeted to try vaping.

What's in That Vape? Poster #3



What's in That Vape? Poster #3

National Standards

Common Core State Standards ELA/ Literacy

- **RI.5.7** Draw on information from multiple print or digital sources, demonstrating the ability to answer a question quickly or to solve a problem efficiently.

CDC National Academic Standard for Health Education

Standard 2 Grades 3–5

- Students will analyze the influence of family, peers, culture, media, technology, and other factors on health behaviors.
- **2.5.3** Identify how peers can influence healthy and unhealthy behaviors.
- **2.5.5** Explain how media influences thoughts, feelings, and health behaviors.

Standard 4 Grades 3–5

- Students will demonstrate the ability to use interpersonal communication skills to enhance health and avoid or reduce health risks.
- **4.5.1** Demonstrate effective verbal and nonverbal communication skills to enhance health.
- **4.5.2** Demonstrate refusal skills that avoid or reduce health risks.