Teens and Vaping: The Real Health Consequences

Help your students understand the health impacts associated with using e-cigarettes.

Objective
Students will gather, analyze, and select relevant evidence from multiple sources to understand the harmful health effects of vaping.

Standards
CCSS ELA
• RI.1 Cite textual evidence
• RI.7 Integrate information in different formats

NGSS
• Obtaining, Evaluating, and Communicating Information
• Cause and Effect

Time
50 minutes

Materials
• Get the Facts About Vaping activity sheet
• The Health Impacts of E-Cigarettes informational text
• What You Need to Know About Vaping interactive
• 6 pieces of blank paper
• 6 sticky notes per student
• Teen & Family resource sheets

1 Tell students you are about to read them a statement, and they should prepare to anonymously write down their response to it on a slip of paper, using: strongly agree, agree, disagree, strongly disagree, and don’t know. Read the statement aloud: Electronic cigarettes are not harmful to your health. Collect the slips (a pre-assessment of student perceptions; you’ll repeat this at the end) while students work on step 2 below.

2 Hand out the Get the Facts About Vaping activity sheet and have students complete the Predictions portion on the left.

3 Separate the class into small groups, encouraging them to choose partners they have not worked with before. Explain that students will be working in their groups to conduct research and gather facts about e-cigarettes to complete the rest of the activity. Ask students what types of resources are reliable places to find information (for example: government websites, scientific papers). As a class, review the five resources listed on the activity sheet.

4 Send groups online to the five resources listed on the activity sheet to conduct research. Remind them to record key pieces of evidence as they explore these resources.

5 While students are working, write down the statements from the activity sheet and hang them around the room. Instruct each group to choose one piece of evidence they think is most relevant to support or disprove each statement, write it on a sticky note, and add the notes to the wall under each statement.

• To support striving learners: Point out that just because a fact is true does not mean it is relevant to the statement. Guide students to understand that they can make stronger arguments by choosing relevant evidence.

• To increase the challenge: For each true-or-false statement, have students find three pieces of evidence that support or disprove it. Have students rank their pieces of evidence in terms of relevance.

6 Direct students to complete the Post-Research portion of the activity sheet. Review as a class. (Answer key: 1. False; 2. True; 3. False; 4. True; 5. True; 6. True.)

7 Reread the statement from Step 1 and again have students respond anonymously on slips of paper, including a sentence about their rationale. Review the slips to measure how students’ perceptions have changed after studying the facts.

8 Hand out the family resource sheets to each student and encourage them to share what they have learned at home. To ensure that parents receive this valuable information, consider sending the resource sheets to your students’ families via email.

Extensions
Have small groups practice scenarios, such as peer pressure to try e-cigarettes, or a friend who uses them. Have students work together to come up with five helpful responses to these situations. Encourage them to include facts to support their statements. Alternatively, have students design comic strips for high schoolers about how to stay vape-free, or design messages for peers about how to quit (e.g., people to contact, support systems).
Get the Facts About Vaping

You may have seen a growing number of your peers vaping. But how much do you know about e-cigarettes and how they affect your health? Read the statements below and predict whether they are true or false in the boxes on the left. Then research the five sources below to gather facts and complete the rest of the chart.

### 1. Predictions

<table>
<thead>
<tr>
<th>Statements</th>
<th>True</th>
<th>False</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Most e-cigarettes contain only water and flavoring.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Like tobacco smoke, the aerosol given off by an e-cigarette can contain dangerous chemicals.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. As long as an e-cigarette doesn’t contain nicotine, it’s safe for teens.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. A Juul pod contains as much nicotine as a whole pack of cigarettes.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Teens who vape are more likely to start smoking cigarettes.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Teens are more vulnerable to nicotine addiction than adults are.</td>
<td></td>
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</tbody>
</table>

### 2. Post-Research

Mark whether the statement is true or false. Record at least three facts that support your answer. Use a separate piece of paper if you need more space.

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**Sources for Research**

1. Interactive and infographic at [scholastic.com/teenvapingrisks](http://scholastic.com/teenvapingrisks)
3. Fact page from the Centers for Disease Control [cdc.gov/tobacco/basic_information/e-cigarettes/index.htm](http://cdc.gov/tobacco/basic_information/e-cigarettes/index.htm)
5. Video: “What’s in a Vape?” [whatsinavape.com](http://whatsinavape.com) (click bottom left at the page)
Vaping Research Project

Help students spread the word about the health consequences of e-cigarette use by designing and conducting a survey at school.

Objective
Students will carry out an investigation to collect and present data about their peers’ knowledge and attitudes about e-cigarettes.

Standards

**CSS Math**
- HSS.ID.A.1 Represent data, including dot plots
- HSS.ID.A.4 Use the mean and standard deviation
- HSS.ID.B.6 Represent data on a scatter plot

**CSS ELA**
- SL.4 Present claims and findings

**NGSS**
- LS2.D Social Interactions and Group Behavior
- Planning and Carrying Out Investigations
- Patterns

Time
40 minutes, plus additional time for students to conduct surveys and class presentations

Materials
- Plan an E-Cigarette Survey activity sheet
- Vaping Facts & Misperceptions infographic

1. **Ask** students to predict how a graph showing high-school e-cigarette use from 2015 to 2019 would look. Then project the chart below. Have volunteers plot the graph on the board. Discuss, asking guiding questions: What research question might scientists have asked to gather this data? What might their hypothesis have been? How might they have collected the data? Why is it useful for scientists and health officials?

<table>
<thead>
<tr>
<th>Year</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>16.0%</td>
</tr>
<tr>
<td>2016</td>
<td>11.3%</td>
</tr>
<tr>
<td>2017</td>
<td>11.7%</td>
</tr>
<tr>
<td>2018</td>
<td>20.8%</td>
</tr>
<tr>
<td>2019</td>
<td>27.5%</td>
</tr>
</tbody>
</table>

Source: National Youth Tobacco Survey 2019

2. **Explain** that students will conduct a survey to learn what their peers know about the health risks associated with e-cigarettes. Ask them to share questions they have, such as: How many teens know that nicotine is in most e-cigarettes? Record their questions on the board. As a class, brainstorm specific survey questions that could gain peer responses to their questions, such as: Did you know that the addictive chemical nicotine is in most e-cigarettes?

3. **Separate** the class into small groups and distribute the activity sheet Plan an E-Cigarette Survey. Have students complete Steps 1–2 in their groups collaboratively.

4. **Review** Step 3 of the activity sheet as a class. Tell the class they will be creating aggregate data (grouped). To maintain student privacy, have students create a questionnaire sheet, make copies, and pass it out for peers to mark answers anonymously. Completed surveys can go in a cardbox or manila envelope, taped shut with a slit on top. Each group’s survey can be labeled with a number or keyword that is also on their box or envelope. Emphasize the importance of being organized when collating data so that nothing gets duplicated or lost, rendering the data untrustworthy.

5. **Discuss** what a diverse representative sample would look like across the school. In addition to considering gender and race, students should find a diverse mix of students with various interests and sports/club participation, different friend groups, introverted and extroverted, etc.

6. **Direct** students to conduct their surveys and then analyze and graph their data. Finally, have each group create a class presentation that clearly describes how the survey was conducted, uses visual elements to present their data, and includes conclusions they made based on the data.

   - **To support striving learners:** Discuss what types of graphs would be most useful for displaying data.
   - **To increase the challenge:** Have students compare their results with national surveys and consider why the data may be different (e.g., sample size, concerns about anonymity, etc.).

7. **Guide** students to critically analyze each group’s presentation and assess how well the evidence supported the group’s conclusions. Encourage them to be respectful and constructive.

8. **Wrap up** by reading facts aloud from the Vaping Facts and Misperceptions infographic to help dispel any incorrect statements that may have arisen in presentations.

### Extension

Have students use their data to create anti-vaping info cards. Prompt them to choose facts and images that’ll make teens pay attention. Reproduce the cards and pass them out as a class, or develop them into memes and distribute digitally via social media platforms.
Plan an E-Cigarette Survey

Teens are using e-cigarettes in record numbers. Do your peers understand the health risks? Use the steps below—writing your answers on a separate sheet of paper—to plan and conduct a survey about what your classmates know about e-cigarettes.

1 Find Your Research Focus
What would you like to learn from your classmates? Write 3–5 clear and open-ended research focus questions (not “yes or no” questions).

• Examples:
  - What do my peers know about the health risks of e-cigarettes?
  - What are other factors that may increase the chance or decrease the chance that a teen would try e-cigarettes or other tobacco products?

2 Write Survey Questions
Choose one or two research focus questions from Step 1. On separate paper, write 5–10 specific and close-ended survey questions to get targeted answers from your peers.

• Example: Questions should narrow in on specific, detailed responses. Rather than asking “What do you know about e-cigarettes?” you might ask, “Did you know most e-cigarettes contain nicotine, an addictive chemical?”

3 Make Predictions
Using your knowledge of the news and your own experiences, predict the findings for each of your questions.

4 Collect Data
Keeping it anonymous, share your survey with various types of teens to accurately represent the diversity of the whole population. In other words, you want a representative sample of teens.

• Tip: The more people you include in your survey, the more reliable your results. (The number of people you survey is called your sample size.)

5 Analyze Your Data
Organize your data in charts and graphs to see trends.

- A dot plot shows the difference between individual groups.
- A line graph represents change over time, and a scatter plot shows the relationship between two variables.
- The mean is the average.
- The standard deviation is how spread out the data is (variation).

6 Present Findings
Create a presentation for your classmates in the form of a slideshow, a blog post, a short video clip, or a PSA campaign series. Be sure to include:

- Your survey method
- Text descriptions and visual representations of your data
- Your conclusions (supported by your data) about the teen population and e-cigarettes
Sizing Up E-Cigarette Marketing

Encourage students to uncover the misleading ways e-cigarettes are marketed to teens.

Objective
Students will analyze the messages delivered by e-cigarette marketing and design their own effective anti-vaping advertisement for teens.

Standards
CCSS ELA
• W.1 Write arguments to support claims
• RH.11-12.8 Evaluate an author’s claims

C3
• D4.2 Construct explanations using sound reasoning, pertinent information, and data
• D3.2 Evaluate the credibility of a source

Time
45 minutes

Materials
• Decode the Marketing Message activity sheet
• Optional: A selection of ads for students to choose from in Step 1

1 Direct students to find two different advertisements for any product (other than e-cigarettes). These may include magazine ads, photos of billboards, or printouts or links to television ads or internet ads. They should choose one ad that they think is aimed at adults and one designed for teens.

2 As a class, analyze the messages delivered by the ads. Guide the discussion with questions such as: What features do advertisers use to attract attention? How is an advertisement for adults different from one aimed at teens? What platforms might advertisers use to reach adults versus teens (e.g., TV, internet/social media, blogs, magazines)? Identify features of an advertisement that might mislead a buyer, for example to persuade them to think something is beneficial for their health when it may not be.

3 Separate the class into pairs and hand out the Decode the Marketing Message activity sheet. Instruct students to work collaboratively to complete the activity.

4 Write the following on the board:
• Use what you’ve learned about the dangers of e-cigarettes and the resources at scholastic.com/teenvapingrisks to create your own ad that tells teens the harms of vaping. Think about what platform would be most effective for reaching youth, such as posters, TV ads, blog posts, social media, or magazine ads. Make sure your ad grabs your audience’s attention.

5 Have each pair present to the class the advertisements they created. Guide students to critically analyze one another’s work: Does it grab a viewer’s attention? Who is the audience? Prompt students to use constructive language while discussing the strengths and weaknesses of each advertisement. Example sentence starter: That part grabbed my attention, but this part confused me.

Extension: Final Project
Challenge students to work in small groups to design an anti-vaping campaign for teens. Encourage them to incorporate creative formats to include in their campaign, such as a blog post or series, an art installation, a comic strip, music, or a video series. Discuss what features will lead to a successful campaign, and make a list of critical elements (e.g., captures teens’ attention, includes facts that support message, etc.).
Name ________________________________

Decode the Marketing Message

One factor that people think contributes to the increase in teen vaping is the way that e-cigarette companies promote their products. Answer the following questions to analyze how e-cigarettes are marketed and why the images and methods companies use may put teens at risk.

1. E-cigarette ads and packaging often include features like images of candy, bright colors, and images of “cool” people. What audience do you think these features are designed to draw in? Explain why.

2. Some e-cigarette companies such as Juul have recruited social media influencers who have large numbers of followers on apps like Instagram to help promote their products. Some influencers were paid to promote e-cigarettes by talking positively about them in their posts. How do you think this might impact the number of teens who try e-cigarettes?

3. How might the images and methods used by e-cigarette companies to market their products mislead people into thinking they are safe? Use specific examples to support your answer.

4. In 1970, the U.S. government passed the Public Health Cigarette Smoking Act, which banned tobacco companies from advertising cigarettes on radio and television. Do you think advertising laws affect the choices people make with respect to trying e-cigarettes or traditional tobacco products? Explain your reasoning.
According to a 2019 survey, fewer high school students smoke cigarettes than ever before. But at the same time, the number of high schoolers who use e-cigarettes has risen at an alarming rate. Some teens assume that using these devices—also known as vaping—is a safe alternative to smoking. After all, e-cigarettes can come in flavors, and the mist they produce looks different from the toxic smoke from traditional cigarettes. So how bad can e-cigarettes really be?

The truth is that using e-cigarettes exposes teens to very real—and very scary—health risks. Vaping nicotine (found in most devices) can harm your brain and cause addiction.1 There is also growing evidence that the chemicals found in e-cigarettes can cause serious damage to your lungs.

Lung Damage and Chemicals
E-cigarettes are battery-operated devices that create an aerosol a user inhales. When a person puffs on an e-cigarette, a liquid inside heats up and becomes an aerosol mixture typically containing nicotine, flavorings, and toxic chemicals like acrolein. The e-liquids often come in flavors, but the chemicals used to create these flavors can be harmful to your lungs.
E-cigarette aerosol may also contain metals such as nickel, lead, chromium, tin, and aluminum, and chemicals like formaldehyde, which is known to cause cancer. Breathing in e-cigarette aerosol delivers these chemicals to your lungs where they can cause damage. The effects may be long-lasting—even deadly.

In 2019, the Centers for Disease Control and Prevention (CDC) and the U.S. Food and Drug Administration (FDA) reported an outbreak of serious lung illnesses in nearly every state.\(^2\) Thousands of people, including many teens and young adults, got sick after using vaping products, including e-cigarettes. Patients reported symptoms like difficulty breathing and chest pain. Some people ended up with permanent lung damage, and multiple people died. As the CDC and FDA continue to investigate the cause or causes of the outbreak, one finding is clear: Using any type of vaping product can seriously harm your health.

**Delivering Dangerous Nicotine**
Toxic chemicals aren’t the only harmful thing a person breathes in when they vape. Most devices, including all Juuls, contain a drug called *nicotine*. This is the same highly addictive chemical found in other tobacco products like traditional cigarettes and smokeless tobacco (“dip”). In fact, one Juul pod contains as much nicotine as a whole pack of cigarettes.\(^3\)

Using nicotine causes changes in the brain that make a person crave more of the drug. When someone vapes, nicotine gets into their bloodstream through their lungs and travels to their brain within 10 seconds.\(^4\) The drug causes a surge of a brain chemical called dopamine, which is known as a reward chemical. That means it makes the person feel good, encouraging them to vape some more. This can lead to addiction.

Teens are even more vulnerable to addiction than adults because the brain continues to develop through a person’s mid-twenties. Exposing an adolescent’s brain to nicotine can cause problems with attention, learning, and memory that promote addiction to nicotine. Studies also show that teens who vape are more likely to start smoking traditional cigarettes. One likely explanation is that they’ve become addicted to nicotine.

**What’s Being Done?**
Health experts are concerned about youth vaping because these products are dangerous and teens are becoming addicted. More than one in four high school students currently use e-cigarettes.\(^5\) Health officials continue to crack down on illegal sales to minors and hold retailers and manufacturers accountable for marketing practices. The goal: to reduce the number of teens being exposed to the health hazards of vaping.

**STAY SAFE**
Some high schoolers say they vape because their friends do—either to feel cool or because they’re afraid to say no. What would you do if another kid offered you an e-cigarette? Here are four ways to handle the pressure—and stay safe.

- Say “No, thanks,” or “Nah, that’s not my thing.”
- Make a joke or change the topic.
- Say you’re supposed to be somewhere and walk away.
- Talk to a friend, parent, or trusted adult.

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E-cigarettes, also known as “vapes,” are becoming increasingly popular among teens. In fact, they are the most commonly used tobacco product among both middle and high school students. You may have already seen or heard about students vaping in your school, but it is important to know that certain types of vapes can be used very discreetly.

**SOME TEENS REPORT USING E-CIGARETTES IN SCHOOL BATHROOMS AND EVEN IN THE CLASSROOM.**

Learning more about the different types of e-cigarette products is an important first step in addressing youth vaping.

**DID YOU KNOW:**

- E-cigarettes come in a variety of shapes and sizes and may not look like a tobacco product, which can make them hard to spot.
- Some devices popular among teens — like JUUL and myblu — are as small as a USB flash drive and even look like one.
- Certain products emit very low amounts of aerosol or “vapor,” which makes them easier to use discreetly than combustible cigarettes.
- Most e-cigarettes contain nicotine, the same highly addictive drug in cigarettes. Some e-cigarettes may contain as much nicotine as a pack of 20 regular cigarettes.

**A Big Problem... A SMALL DEVICE**

In 2019, over **27%** of high school students and over **10%** of middle school students were using e-cigarettes.

**Source:** Cullen, et al. JAMA 2019

**Note:** All numbers presented here are estimates.
Many teens have dangerous misperceptions that lead them to believe that vaping is harmless.

**Important facts to share with youth**

<table>
<thead>
<tr>
<th>Vape aerosol can contain harmful chemicals</th>
<th>There can be danger behind the flavor</th>
<th>Most vapes contain nicotine, which is highly addictive</th>
<th>Vapers could be inhaling metal particles into their lungs</th>
</tr>
</thead>
<tbody>
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<td>Vaping can expose the user’s lungs to harmful chemicals like formaldehyde, acrolein, and acetaldehyde, which are known to cause irreversible lung damage.¹⁵</td>
<td>Vapes get their flavors from chemicals. While these flavorings are safe to eat in food, they’re not safe to inhale. Inhaling flavor chemicals can harm your lungs.⁷</td>
<td>Vaping delivers nicotine to the brain in as little as 10 seconds.⁷ A teen’s brain is still developing, making it more vulnerable to nicotine addiction.⁸,¹⁴ Nicotine exposure during the teen years can disrupt normal brain development.⁸,¹⁴ It may have long-lasting effects, like increased impulsivity and mood disorders.⁸,¹²,¹³,¹⁵</td>
<td>Vape aerosol could be delivering metal particles like chromium, nickel, lead, tin and aluminum right into your lungs. Some of these metals are toxic.¹⁰,¹¹</td>
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**FDA’s Efforts to Curb Youth E-Cigarette Use**

FDA is committed to protecting youth from the dangers of e-cigarettes, including working to remove certain flavored e-cigarettes from the market and cracking down on illegal sales to anyone under 18. Also, in addition to our national peer-to-peer public education campaign called "The Real Cost" FDA has joined forces with Scholastic to provide teachers and school administrators with the resources they need to educate their students about e-cigarettes.

Together, we’ve created a free lesson plan and research activity for teachers to educate their students on the health risks of e-cigarette use. Please visit the Scholastic youth-vaping-risks site to access these resources.

**Quitting Help Is Available**

There is an urgent need to share resources with teens who are addicted to e-cigarettes to help them quit. Together with the National Cancer Institute, the FDA has launched a series of web pages to help.

- **Smokefree Teen** — If you identify teens using e-cigarettes at school, it is critical to share the resources at Smokefree Teen to help them quit.

**Other Resources**

If you know a student who has experienced unexpected health or safety problems related to e-cigarettes, we encourage you to report this incident to FDA through the online Safety Reporting Portal. These reports are confidential and help the FDA identify trends and causes. To follow recent information on outbreaks linked to e-cigarette use, visit the FDA and CDC websites.
5. Goniewicz ML et al. Tobacco Control. (2014)
Today’s vaping problem is real: Vaping is on the rise among teens. More than 5 million U.S. youth currently use e-cigarettes. Many kids think vaping is harmless, but it can have serious health consequences. Study these pages to keep you and your family safe.

**Facts About Teen Vaping**

- **Most e-cigarettes, including the popular Juul brand, contain nicotine,** the same highly addictive chemical in regular cigarettes.

- **More than one in four high schoolers currently use e-cigarettes.**

- **Teens are more susceptible to nicotine addiction than adults because their brains are still developing.**

- **Many e-cigarettes used by teens are shaped like USB sticks, pens, or even watches, which makes them easy for students to hide at school.**

- **Kids who vape are more likely to start smoking cigarettes.**

- **A recent outbreak of serious lung illnesses linked to vaping products, including e-cigarettes, has affected thousands of people, including healthy teens and young adults.**

- **Despite what some kids think, vaping is not safe.** In fact, one Juul pod contains as much nicotine as a whole pack of cigarettes.

- **Some e-cigarette aerosols contain chemicals, such as formaldehyde, that can cause cancer.**
Help Quitting

Teens may not know the signs of nicotine addiction. Ask for support from others. Remember: It’s never too late to get help.

**Signs of Addiction**
- Cravings to use e-cigarettes or other tobacco products
- Feeling anxious or irritable
- Continuing to vape despite negative consequences
- Going out of one’s way to get e-cigarettes

**Getting Help**
- Talk to your family doctor about treatment options
- smokefree.gov
- CDC Quitline: 1-800-QUIT-NOW
- For Young People: Text “DITCHJUUL” to 88709
- For Families Helping Young People: Text “QUIT” to 202-899-7550

Ways to Say No

Some teens say they vape because their friends do—either to feel cool or because they’re afraid to say no. Here are four ways to handle the pressure.
- Say a simple “No, thanks,” or “Nah, that’s not my thing.”
- Change the topic (“Hey, are you going to band practice today?”).
- Walk away and do something else.
- Talk with a friend, parent, or trusted adult.

Parent Tips: Healthy Habits at Home

The environment in your home plays a big role in your child’s decisions. Keep it healthy to help kids avoid harmful habits.

- **If you smoke or vape, try quitting.** Teens report that one of the top reasons they try e-cigarettes is because a friend or family member uses them. Share the reasons why you want to quit, and ask your family for their support as you start your journey.
- **Establish a tobacco-free home.** Don’t allow smoking or vaping in your home. Make sure to ban smoking and vaping in your car too.
- **Steer clear of smoking and vaping in public places.** Avoid restaurants, parks, and other locations that allow people to smoke or vape.
- **Set family health goals each week.** Take a walk together around the neighborhood, try a new vegetable each week at dinner, do one-minute yoga stretches together, or challenge everyone to drink more water. Working as a team keeps it fun!