Educator Guide: Vaping, Pollution and eWaste Lesson

Recommended for Grades:

9th – 12th

Time:

7 minutes

National Health Education Standards:

This activity aligns with the following National Health Education Standards:

- Standard 1: Use functional health information to support health and well-being of self and others.
- Standard 3: Access valid and reliable resources to support health and well-being of self and others.
- Standard 8: Advocate to promote health and well-being of self and others.

For more information about the National Health Education Standards, visit the SHAPE America website: shapeamerica.org.

Learning Objectives:

After completing this lesson students will be able to:

1. Identify harmful chemicals in vaping liquid.
2. Explain the impact of vaping on the environment.
3. Advocate for better disposal and recycling processes.
4. Determine how to find valid health information online.

Lesson Description:

In this lesson students will learn how vaping and vape devices impact the environment. They will learn what's in vaping products and the chemicals in them that can damage the environment and negatively impact health. They will learn about plastic waste and eWaste and how to advocate for improved disposal. They will also learn how to search online for reliable health information.

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Pre and Post-Test Questions:

Use the following questions with your students in any way that you see fit (on paper, using a survey tool, etc.) You may choose to combine questions from various lessons and activities that your students participate in. Correct answer choices are bolded.

1. What is the best way to dispose of vaping devices?
    a. Throw them in the trash.
    b. Throw them in the recycling bin.
    c. Dispose of as e-waste.
    d. Toss them on the ground.

2. Which of the following chemicals can be found in e-liquid?
    a. Nicotine
    b. Flavorings
    c. Cancer causing chemicals
    d. Heavy metals
    e. Formaldehyde
    f. All of the above

3. How do vape devices impact the environment? Select two.
    a. Chemicals get into the soil and water from improper disposal
    b. They provide fertilizer for the soil
    c. They make up a lot of plastic waste

4. How can you find valid health information online?
    a. Trust the first option that comes up
    b. Find an online community forum
    c. Include the topic and a source you trust

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Vocabulary:

Use the following list of vocabulary as a reference for yourself and your students as you complete the Vaping, Pollution and eWaste Lesson. You may choose to use this list in any way that fits your needs.

- Chemicals – substances that have specific properties or characteristics that can be used to identify them. They may interact with other substances and change form.
- Chemical exposure – coming into contact with a substance that can cause harm to your health through breathing, touching, swallowing or eye contact.
- Cobalt – a hard metal used in batteries, tools and machines. It is toxic when inhaled and can damage the lungs and other organs.
- Disposal – the responsible handling of vaping devices and what's in them after they are used. Hazardous waste collection sites are a good way to dispose of vape devices.
- Disposable vapes – vape devices that are meant to be used once and recycled or disposed of when they're empty. They are not made to be refilled or recharged.
- Environmental health – how someone's surroundings and the things they are exposed to affect their health. A healthy environment should be clean, safe and free from harmful pollutants or chemicals.
- E-liquid – the fluid in vaping devices. Also called e-juice or vape juice. It typically contains water, nicotine and other chemicals. It can also contain chemicals that add flavors to the liquid.
- E-waste – discarded electrical and electronic products. They need to be recycled or disposed of properly to avoid harming the environment
- Flavorings – additives that impact the taste and smell of e-liquids to make them more appealing. They are often candy or fruit flavored.
- Formaldehyde – a harmful chemical that can form if the e-liquid gets too hot or if not enough liquid reaches the heating element. It is meant to be a preservative and is very harmful when inhaled into the lungs.
- Heating element – a part of a vaping device that heats up to turn liquid into vapor
- Heavy metals – a group of metallic elements that are toxic and can build up in the body, which causes harm
- Lithium – a soft, shiny metal used in things like batteries and medicine
- Lithium-ion battery – a type of rechargeable battery that stores and releases energy and is used in mobile devices, electric vehicles, vape devices and some toys. They can catch fire if damaged and are harmful to the environment if not recycled properly.
- Nicotine – a highly addictive stimulant drug found in tobacco and vaping products

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- Personal health – the mental, physical and emotional well-being of a person that includes how well the body functions and stays free from illness
- Propylene glycol – a liquid that is commonly added to food. It's also found in antifreeze, paint solvent and fog machines.
- Recycling – the process of turning used materials into new products to reduce waste and save resources
- Secondhand smoke – the smoke that comes from the burning end of a tobacco product or the smoke that a smoker breathes out. Breathing in secondhand smoke is harmful.
- Source – a place where online information comes from. This could include websites, online articles or videos.
- Vape device – something that uses a battery to heat up a vaping liquid into a vapor that is breathed in
- Vaping industry – people and companies that make, sell and market vaping products
- Vegetable glycerin – a thick, sweet liquid used to create the vapor in vapes. It can affect the lungs and cause health issues when inhaled over time.
- Vitamin E acetate – a chemical sometimes added to vape products that contain THC and can cause serious lung damage when inhaled

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Supplemental Activity: Advocate for Better E-Waste Disposal

Objectives:

After completing this activity students will be able to:

- Research e-waste disposal options in their community.
- Write a letter to an elected official advocating for an e-waste disposal change.

Materials Needed:

- Internet access
- Letter writing materials (pen and paper, word processing software or email access)
- Envelopes and postage if needed

Time Required:

45 minutes

Instructions:

Either individually or in small groups, have your students research and make a list of e-waste disposal options in your community. The Wisconsin Department of Natural Resources E-Cycle webpage is a good place to start.

Next, let your students know they will be completing a letter writing activity to an elected official that advocates for a change in e-waste and vape device disposal. Each student could write their own letter, or you can do this activity in small groups or as a class. The recipient of the letter could be a member of the school board, a local official or a representative at the state or federal level. Either provide contact information for an elected official or ask your students to find a mailing or email address for their office.

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The letters should include:

- A clear introduction that includes who you are and why you are writing this letter
- Information about e-waste, including why it is harmful and available statistics
- What you are asking the elected official for. This could include school or community e-waste recycling programs, a larger number of or more accessible e-waste drop off sites, a policy change or increased e-waste education.
- A reason why e-waste matters to you and why it should matter to them. Include a personal connection or how this change could benefit your community.
- A conclusion that thanks them for their time and consideration
- A closing salutation, such as sincerely, then sign your name, group members names or the name of the class

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Handouts

Included on the following pages are additional resources that you and your students' families may find useful.

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What is Vaping? What Parents and Caregivers Should Know

What Is Vaping?

Vaping is breathing in and out the vapor from an e-cigarette or vape device.

- Most vape devices have nicotine.
- They also have a liquid with harmful chemicals.
- There is often a vape mist or a vape cloud when it's breathed out.

What Are the Risks of Vaping?

Vaping is harmful. Vape products are new, so we do not know all of the ways it can affect health. But we do know some of the health risks:

- Addiction
- Sleep issues
- Mental health issues
- Lung damage
- Breathing in chemicals that cause cancer

For kids in school, vaping can lead to:

- School issues, like trouble with focusing and self-control
- Being kicked off of sport teams or other school activities
- Social changes with family and friends
- Problems with money, because of vaping costs

The Tobacco 21 Law

In 2019, the United States raised the minimum age to buy tobacco and vaping products to 21. This law is often called Tobacco 21.

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Vape Companies Are Focused on Kids

The vaping and tobacco industry uses social media to reach kids and teens. They try to get them to use their products.

- They also add flavors to vape products to make them fun for kids.
- They make vapes that look like things kids and teens use each day. This helps kids hide vaping at school and from their families.
- The vape industry finds ways around rules the government makes so they can keep selling their products.

What You Can Do to Help

Talk to your child about vaping and answer questions they might have. It is okay if you don't know all of the answers. You can look up answers together and keep the conversation going. Be sure to keep checking in with your child about vaping. See if they have anything new they would like to talk about.

Vaping Resources

Visit the websites below for more information about vaping and help quitting.

- American Heart Association: heart.org
- American Lung Association: lung.org
- My Life, My Quit: mylifemyquit.org
- The National Cancer Institute's Tobacco Control Research Branch: smokefree.gov
- Truth initiative: truthinitative.org
- Wisconsin Quit Line: quitline.wisc.edu
- Wisconsin's tobacco prevention and control movement: tobwis.org

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What to Do if Your Child Is Vaping

When talking to your child about vaping, there are many ways to get started. Here are a few tips:

- Focus on their health and safety, not punishment.
- You can start by talking about vaping you have seen on a show or share a news article about vaping.
- Ask your child open-ended questions that do not have a simple yes or no answer.
- Focus on listening to your child.

Signs Your Child Is Vaping

Companies that make vape products and devices are making them look like everyday items. This makes devices difficult to notice. Here are some common things to look for:

- USB or flash drives that are vape devices
- Pods or cartridges that hold the vape liquid
- Flavoring scents

Vaping can impact how your child acts. Here are some signs your child may be vaping:

- They are more anxious or annoyed
- They eat less food and drink more
- Their mood and behavior is different

Vaping can lead to health-related symptoms that can include:

- Breathing issues
- Cough or sore throat
- Headaches
- Dry mouth

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What to Do if Your Child Is Vaping

If your child is going to quit vaping, they need to want to stop. Let them know you are there to help them. Here are some things you can try:

- Ask them why they started vaping. This can help them to come up with a plan to avoid those things that cause them to vape. This will help them quit.
- Explain that there are resources to help them quit. They are not in this alone.
- Ask their doctor for resources and help.
    - Make sure to bring up vaping at your child's yearly visit.
    - If your child needs help right away, make an appointment.
    - If you think your child trusts their doctor, they might be willing to talk with them about vaping.

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Tips and Resources to Help Quit Vaping

Quitting vaping can be hard, but there are things you can do to make it easier. It's important to identify your triggers, which are the things that make you want to vape, and make a plan of action to avoid using again.

If you have a craving to vape, keep in mind that they last 10-20 minutes. To get through a craving without slipping, you can:

- Remind yourself why you want to quit.
- Keep yourself busy while the craving passes.
- Exercise, take a walk or call a friend.
- Chew gum or suck on a piece of candy.
- Listen to music or try a mindfulness activity.
- If you feel like you need to inhale from a device, find a straw and suck air from it.

If you have a slip, just re-start your quitting plan.

Mindfulness Resources to Help Deal With Stress and Cravings
Mindfulness practices will help you most if you do them for five to ten minutes each day. Here are some things you can try:

- Watch this mindful jar video to help settle your mind.
  - https://youtu.be/1MefB0P8ptA?feature=shared
- Use this Hoberman sphere video to focus on your breathing.
  - https://youtu.be/QX1LgYMdHw0?feature=shared
- Try things to keep your hands and mind focused:
  - Adult coloring
  - Playing with play foam or clay
  - Making and playing with slime
- Visit Mindfulness for Teens from Dr. Dzung Vo.
  - www.mindfulnessforteens.com/guided-meditations
- Use the Headspace website or app: headspace.com

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Resources You Can Use to Quit Vaping

Smokefree Teen

- Web-based quit plan tool for teens
- Offers text support and app support
- Teen specific management of triggers and cravings
- https://teen.smokefree.gov/

Truth Initiative

- Designed for teens and young adults
- This is Quitting text messaging program for teens and young adults
  - Text DITCHVAPE to 88709
- Text program for parents
  - Text QUIT to (847) 278-9715
- https://truthinitiative.org/

Wisconsin Quit Line

- 24/7 support online, through text or over the phone
- Free coaching support
- Medication or nicotine replacement therapy (NRT) for 18 years or older
- Call 800-QUIT-NOW or text VAPEFREE to 873373
- https://quitline.wisc.edu/

My Life, My Quit

- Free and confidential way for teens to quit vaping
- Offers coaching support
- Text Start My Quit to 36072
- https://mylifemyquit.com
-

American Lung Association

- Offers quitting information and programs for teens
- Has information to help someone else quit
- Vape-free school programs
- https://www.lung.org

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Resources and Services: Alcohol and Other Drug-Use Prevention

- American Lung Association Lung Help Line, 1-800-LUNG-USA (800-586-4872)
- Children's Wisconsin, www.childrenswi.org
- KidsHealth, www.kidshealth.org
- LifeStance Health, www.lifestance.com
- National Institute on Drug Abuse (NIDA), www.drugabuse.gov
- Partnership to End Addiction, www.drugfree.org
- Rogers Behavioral Health, www.rogersbh.org
- The Tobacco Control Resource Center for Wisconsin, www.tobwis.org
- United States Government-Drug Enforcement Administration (DEA), www.getsmartaboutdrugs.gov
- Wisconsin Tobacco Quitline, 1-800-QUIT-NOW

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Transcript

Slide 1

Hey, in this lesson we're going to learn about vaping and how it negatively impacts the environment.

We'll talk about what's in a vape device, disposable vape products and how they impact the environment and what the vaping industry should do to help reduce e-waste.

We'll also learn how to access reliable information online.

Slide 2

Vape devices can look different, but they have some things in common. They all contain these three parts:

- E-liquid
- A lithium-ion battery
- And a heating element.

Click on each button to learn more about them.

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Slide 2a

One thing that's in all vape devices is e-liquid. It's sometimes called vape juice or e-juice, and it has many chemicals in it. Some of those chemicals can include:

- Nicotine
- Propylene glycol or vegetable glycerin
- Vitamin E acetate
- Flavorings
- Formaldehyde
- Heavy metals
- And other cancer-causing chemicals.

When someone breathes out after vaping, some of these chemicals go into the air. We know that secondhand smoke from cigarettes is dangerous, but we don't know much about secondhand chemical exposure from vape products.

When vape products are thrown on the ground as litter, these chemicals can get into the soil and the water. This can negatively affect the food we eat and the water we drink. It can also have a negative impact on the animals that live in or drink that same water.

Vaping hasn't been around as long as smoking cigarettes has, so we're still learning about how it negatively impacts people and the environment.

Slide 2b

Each vape device runs on a lithium-ion battery. The chemicals in these batteries make them dangerous, toxic, and a fire hazard.

Lithium is an element, and it's a light, soft metal that is often found in rocks and water. Its main use is in batteries, but it can also be used to make alloys, ceramics and can be used in medicine. Mining lithium leads to water pollution in areas around the mine.

Cobalt is also an element that is used in batteries. Researchers are working on finding a better alternative because cobalt is expensive, scarce or rare, and it is toxic. Mining cobalt produces toxic byproducts, which include sulfur. Sulfur from mining turns into sulfuric acid in the air and water, which impacts rivers, streams and the animals that live in that water.

These batteries can explode in people's pockets or near their faces while they are vaping. It's rare, but it can happen. If these batteries aren't disposed of properly, they can also cause fires at landfills and release toxic chemicals into the environment.

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Slide 2c

Vape devices have a heating element in them, which is also called an atomizer or coil. These have been found to contain toxic metals, including nickel and lead.

These metals are heated up, released into the vapor, breathed into the lungs, absorbed into the body, and then what's left is breathed out in a vape mist or cloud.

Slide 3

Vape devices should be disposed of as e-waste. But unfortunately, most young people who vape don't know how to dispose of them. Vape devices end up in the trash, recycling bin, or on the ground.

A lot of vape devices that young people use are made to be used once. These are called disposable vapes. Puff bars are one example of this type.

Other devices, called pod vapes, have plastic pods that are replaced. Juuls are an example of this type.

Both disposable vapes and pod vapes make up a lot of plastic waste and can lead to chemicals from e-liquid getting into the soil or the water from littering or improper disposal.

Slide 4

A recent study found that more than half of young people who vape use disposable vapes. They cost less than other types of vapes, so they're more affordable for young people.

Because they are single use, this means more e-waste and plastic waste. Americans throw out almost six disposable vape products every second.

There are few products as popular and harmful to personal health or environmental health as disposable vapes.

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Slide 5

The vaping industry claims that they are helping to clean up e-waste from vape products, but the truth is they aren't doing much. They created this problem, so they should be doing more to help fix it.

They should let people know how to best dispose of their products through:

- campaigns on social media
- advertisements on streaming services
- and on vape packaging

They could also work with vape shops or local governments to collect their products. This could include dropping off used products where they are purchased or by creating clearly marked recycling bins for e-waste.

Slide 6

If you do an internet search to find vaping information, the first results you get probably won't come from a reliable source. You'll find a lot of articles from the vaping industry or vape shops, probably some online communities, and you'll have to do some digging to get to something that's written by scientists or experts.

If you're looking for reliable information about vaping online, include a source you can trust in your search bar. For example, vaping American Lung Association.

Slide 7

We've learned a lot about vaping, chemicals and e-waste and how these things can have a negative impact on the environment.

Now it's time to see what you've learned by answering some questions.

Question 1

What is the best way to dispose of vaping devices? Drag the best answer to the blank space.

- Throw them in the trash.
- Throw them in the recycling bin.
- Dispose of as e-waste.
- Toss them on the ground.

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Question 1 correct

That's right! E-waste can't be recycled in regular recycling bins. Throwing vape devices in the trash can lead to fires at landfills and tossing them on the ground is not good for the environment.

Question 1 incorrect

That's not correct. They should be disposed of as e-waste. E-waste can't be recycled in normal recycling bins. Throwing vape devices in the trash can lead to fires at landfills and tossing them on the ground is not good for the environment.

Question 2

What chemicals can be found in e-liquid? Drag the correct answers to the blank spaces.

- Nicotine
- Heavy metals
- Iodine
- Propylene glycol
- Vegetable glycerin
- Carbon dioxide

Question 2 correct

That's right!

Question 2 incorrect

That's not correct. Nicotine, heavy metals, propylene glycol and vegetable glycerin are found in e-liquid.

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Question 3

How does vaping negatively impact the environment? Drag the correct answers to the blank spaces.

- It creates plastic waste.
- Some chemicals are good fertilizer.
- Lithium mining uses a lot of water.
- Cobalt mining produces sulfur and sulfuric acid.
- Vaping isn't that bad for the environment.

Question 3 correct

That's correct!

Question 3 incorrect

That's incorrect. Vaping creates plastic waste, lithium mining uses a lot of water, and cobalt mining produces sulfur and sulfuric acid. These all negatively impact the environment.

Question 4

How should you find reliable health information online? Drag the correct answers to the blank spaces.

- Trust the first result.
- Include a source you can trust in the search bar.
- Search for the topic you're interested in.
- Use online communities.

Question 4 correct

That's right!

Question 4 incorrect

That's not correct. You should search for the topic you're interested in AND include a source you can trust in the search bar.

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Conclusion

Even if you don’t vape, it still impacts you and the planet you live on.

Encourage people you care about to stop vaping or get involved in holding the vaping industry accountable for the damage they are doing.

Writing letters or emails to your local lawmakers is a great place to start!

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