

In the past year alone,  
**vaping** among  
**high schoolers** has increased

CENTER FOR  
TOBACCO  
PRODUCTS



FDA

**78%**

How much **do you know** about the epidemic?

E-cigarettes, also known as “vapes,” are becoming increasingly popular among teens.<sup>1,2</sup>

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.<sup>3</sup>

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.<sup>4,5</sup> Some e-cigarettes may contain as much nicotine as a pack of 20 regular cigarettes.<sup>3</sup>

## A Big Problem...

## A SMALL DEVICE



Over  
**10.7 million**  
youth aged 12–17  
are at-risk for using  
e-cigarettes.<sup>6,7</sup>

# Many teens have dangerous misperceptions that lead them to believe that vaping is harmless.

## Common myths believed about vaping, along with the facts.

“It’s just water vapor.”

But it’s not.

Vaping can expose the user’s lungs to harmful chemicals like formaldehyde, diacetyl and acrolein, as well as toxic metal particles like nickel, tin and lead.<sup>4,8-10,11-13</sup>

“It’s just flavoring.”

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.<sup>11</sup>

Want an example?

Some buttery-flavored vapes like caramel contain diacetyl and acetoin. Inhaling diacetyl has been linked to popcorn lung, a lung disease that doesn’t have a cure.<sup>11</sup>

“I don’t have an addictive personality—I won’t get hooked on vapes.”

Some vapes that claim they are nicotine-free are not.<sup>8,17-22</sup>

“My vape says it’s nicotine-free. There’s no way I’ll become addicted.”

Vaping delivers nicotine to the brain in as little as 10 seconds.<sup>14,15</sup>

A teen’s brain is still developing, making it more vulnerable to nicotine addiction.<sup>16</sup>

“Nicotine isn’t that bad for me.”

Nicotine exposure during the teen years can disrupt normal brain development. It can have long-lasting effects, like increased impulsivity and mood disorders.<sup>23-25</sup>

“Just because I vape doesn’t mean I’m going to smoke cigarettes.”

Research shows teens who vape are more likely to try smoking cigarettes.<sup>26</sup>

## FDA’s Efforts to Curb Youth E-Cigarette Use

FDA is committed to protecting youth from the dangers of e-cigarettes. In addition to our national peer-to-peer public education campaign called “The Real Cost,” we’re joining 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](https://www.scholastic.com/youth-vaping-risks) to access these resources.

## Share This Information



Please share this infographic with other teachers and school administrators. In addition, if you’d like to learn more about e-cigarettes, check out these resources:

- » [Surgeon General Fact Sheet](#) – E-cigarette use among youth and young adults
- » [Parent Tip Sheet](#) – How parents can talk with their teen about vaping
- » [CDC Infographic](#) – E-cigarette ads and youth infographics
- » [Smokefree Teen](#) – If you know a teen who is addicted to any tobacco product, including cigarettes and e-cigarettes, there are resources to help them quit

# References

1. Wang TW, Gentzke A, Sharapova S, Cullen KA, Ambrose BK, Jamal A. Tobacco product use among middle and high school students – United States, 2011–2017. *MMWR Morb Mortal Wkly Rep*. 2018;67:629–33.
2. Notes from the Field: Increase in use of electronic cigarettes and any tobacco product among middle and high school students — United States, 2011–2018.
3. Centers for Disease Control and Prevention (CDC). Smoking & Tobacco. [E-cigarettes shaped like USB flash drives: Information for parents, educators and health care providers](https://www.cdc.gov/tobacco/infographics/youth/pdfs/e-cigarettes-usb-flash-508.pdf). <https://www.cdc.gov/tobacco/infographics/youth/pdfs/e-cigarettes-usb-flash-508.pdf>. Accessed October 22, 2018.
4. Goniewicz ML, Hajek P, McRobbie H. Nicotine content of electronic cigarettes, its release in vapour and its consistency across batches: regulatory implications. *Addiction*. 2014; 109(3):500–7.
5. Marynak KL, Gammon DG, Rogers T, Coats EM, Singh T, King BA. Sales of nicotine-containing electronic cigarette products: United States, 2015. *American Journal of Public Health*. 2017; 107(5):702–705.
6. U.S. Census Bureau. Annual estimates of the resident population by single year of age and sex for the United States: April 1, 2010 to July 1, 2015. Washington, DC: U.S. Census Bureau. Published 2016.
7. Centers for Disease Control and Prevention (CDC), U.S. Food and Drug Administration (FDA). Total at-risk experimenters and susceptible non-trier estimates: 2015 NYTS dataset and codebook. Atlanta, GA: CDC. Updated 2015.
8. Cheng T. Chemical evaluation of electronic cigarettes. *Tobacco Control*. 2014; 23:ii11–ii17.
9. Bein K, Leikauf GD. Acrolein—a pulmonary hazard. *Molecular Nutrition & Food Research*. 2011;55(9):1342–1360.
10. Occupational Safety and Health Administration (OSHA). Occupational Safety and Health Standards. [Medical surveillance – Formaldehyde](https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10078). Washington, DC: U.S. Department of Labor, *Occupational Safety and Health Administration*. [https://www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_table=STANDARDS&p\\_id=10078](https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10078). Accessed May 8, 2018.
11. Allen J, 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-, cocktail- flavored e-cigarettes](https://ehp.niehs.nih.gov/15-10185/). *Environ Health Perspect*. 2016;124. <https://ehp.niehs.nih.gov/15-10185/>. Accessed March 27, 2018.
12. Williams M, Villarreal A, Bozhilov K, Lin S, Talbot P. Metal and silicate particles including nanoparticles are present in electronic cigarette cartomizer fluid and aerosol. *PLoS One*. 2013; 8(3):e57987.
13. Olmedo P, Goessler W, Tanda S, et al. Metal concentrations in e-cigarette liquid and aerosol samples: the contribution of metallic coils. *Environmental Health Perspectives (Online)*. 2018; 126(2).
14. St Helen G, Havel C, Dempsey DA, Jacob P, Benowitz NL. Nicotine delivery, retention and pharmacokinetics from various electronic cigarettes. *Addiction*. 2016;111(3), 535–544.
15. U.S. Department of Health and Human Services (USDHHS). *A Report of the Surgeon General: How Tobacco Smoke Causes Disease: What It Means to You (Consumer Booklet)*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2010.
16. U.S. Department of Health and Human Services (USDHHS). *A Report of the Surgeon General: Preventing Tobacco Use among Youth and Young Adults. We Can Make the Next Generation Tobacco-Free (Consumer Booklet)*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2012.
17. Vansickel AR, Eissenberg T. Electronic cigarettes: Effective nicotine delivery after acute administration. *Nicotine & Tobacco Research*. 2013; 15:267–270.
18. Hecht SS, Carmella SG, Kotandeniya D, et al. Evaluation of toxicant and carcinogen metabolites in the urine of e-cigarette users versus cigarette smokers. *Nicotine & Tobacco Research*. 2015; 17(6):704–709.
19. Adriaens K, Van Gucht D, Declerck P, Baeyens F. Effectiveness of the electronic cigarette: an eight-week Flemish study with six-month follow-up on smoking reduction, craving and experienced benefits and complaints. *International Journal of Environmental Research and Public Health*. 2014; 11:1220–1248.
20. Etter JF. Levels of saliva cotinine in electronic cigarette users. *Addiction*. 2014; 109(5):825–829.
21. Trehy ML, Ye W, Hadwiger ME, et al. Analysis of electronic cigarette cartridges, refill solutions, and smoke for nicotine and nicotine related impurities. *Journal of Liquid Chromatography Related Technology*. 2011; 34:1442–1458.
22. Trtchounian A, Talbot P. Electronic nicotine delivery systems: is there a need for regulation? *Tobacco Control*. 2011; 20(1):47–52.
23. U.S. Department of Health and Human Services (USDHHS). *E-Cigarette Use Among Youth and Young Adults: A Report of the Surgeon General*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2016.
24. England LJ, Aagaard K, Bloch M, et al. Developmental toxicity of nicotine: A transdisciplinary synthesis and implications for emerging tobacco products. *Neuroscience & Biobehavioral Reviews*. 2017; 72:176–189.
25. Dwyer JB, McQuown SC, Leslie FM. The dynamic effects of nicotine on the developing brain. *Pharmacology & Therapeutics*. 2009; 122(2):125–39.
26. National Academies of Sciences, Engineering, and Medicine (NASEM). 2018. [Public Health Consequences of E-cigarettes](https://doi.org/10.17226/24952). Washington, DC: The National Academies Press. Doi: <https://doi.org/10.17226/24952>.