It’s been called “a runaway problem” and a “worrysome trend.” It’s a big issue in schools. The problem? Dramatically rising vaping rates among teens.

Canadian teenage vaping rates have soared, says University of Waterloo professor David Hammond. His recent study shows that the percentage of Canadian teens 16 to 19 who said they had vaped in the last month has grown. In 2017 it was 8.4. In 2018, it was 14.6. That’s a 74 percent increase in one year.

The spike is a concern because e-cigarettes are relatively new. It could be years before the risks of exposure to chemicals in vaping products are fully understood.

**HOW E-CIGARETTES WORK**

An e-cigarette has two parts. One is a vaporizer, or vape pen. The other is a cartridge of e-liquid (e-juice). The liquid can be dissolved nicotine or cannabis compounds along with other chemicals and flavourings. This juice is sold in appealing flavours, such as apple, watermelon menthol, bacon, and bubblegum.

Vaporizing devices have a tiny battery that powers a coil. The coil heats up the e-juice and turns it into a vapour. Users draw the vapour into their lungs.

E-cigarettes mimic the look and feel of regular cigarettes. The key difference? E-cigarettes don’t contain tobacco and there is no combustion. Users get nicotine without inhaling tobacco smoke.

They also avoid the thousands of chemicals and dozens of cancer-causing toxins present in traditional cigarettes. Instead, e-cigarette users puff a vapour.

**MYSTERY ILLNESS**

When e-cigarettes arrived in 2004, many people thought they could be useful. They were seen as a possible tool for lowering cigarette or cannabis use. Still, no one thought they were healthy or risk-free. Now, doctors warn of serious illness likely linked to vaping. It is affecting hundreds of people, mostly teenagers.

By mid-October, 1604 vaping-related illnesses and 34 deaths had occurred in the United States. Cases have also been reported in Canada. The median age of those affected is 23. Symptoms include cough,

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**DEFINITIONS**

**COMBUSTION**: the process of burning something  
**TOBACCO**: a plant with large, sticky leaves that are smoked or chewed  
**VAPING**: inhaling and exhaling the vapour produced by an electronic cigarette or similar device
shortness of breath, chest pain, fatigue, and vomiting. Many people need oxygen or mechanical ventilation to recover.

The suspected cause is chemical inhalation. Our lungs are only equipped to inhale clean air. When we breathe in something that we shouldn’t, the air sacs in the lungs meant for respiration become lined with the substance. That makes it hard for them to pump oxygen through the body.

Health officials are still figuring out which ingredient or additive is responsible. Researcher Michael Siegel of Boston University says there are two possibilities. The first is oil. Oils are sometimes added as thickening agents to black-market vaping product. This is especially true of products containing tetrahydrocannabinol (THC). It’s the chemical that gives marijuana its high.

The second suspect is a contaminant in e-liquid. It appears to cause lung damage and severe inflammation. Contaminants are more often found in products bought on the street than in a licensed store.

In October the U.S. Food and Drug Administration (FDA) issued an alert. It warned people to stop using vaping products containing THC. It also advised people not to buy vaping products from unauthorized sources. It stressed that “… no youth or women who are pregnant should be using any vaping product, regardless of the substance.”

Health Canada tobacco expert James Van Loon agrees. He says young people should never use e-cigarettes because we don’t understand all the risks.

**TURNING THE TIDE**

Yet youth vaping remains on the rise. Why? One key reason is that vaping has changed dramatically in the last two years. Newer devices, made by companies such as Juul, deliver more nicotine to the brain than ever. One cartridge now has roughly the same nicotine as a pack of 20 cigarettes.

To prevent a new generation of addicts, experts say we need tougher laws on all aspects of vaping. Dr. Hammond adds that we also have to change our thinking.

“We have to find a way of… [protecting] kids and change the perceptions of these things as a fun, modern, sleek way of taking your drugs,” says Dr. Hammond. ★

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**ABOUT NICOTINE**

Nicotine is absorbed through the lungs, nose, mouth, or skin. It is not, on its own, responsible for tobacco-related illnesses such as cancer or heart disease. However, it can change brain development and affect memory and concentration. It is also highly addictive. It is what keeps smokers smoking, or vapers vaping. When users try to quit, they experience unpleasant withdrawal symptoms.

Not all vaping products contain nicotine, but most do. That’s why some smokers see e-cigarettes as a **harm reduction** tool. Because the nicotine intake can be adjusted, they believe switching to e-cigarettes can help smokers cut back and eventually kick the habit.

But maybe not. “There is some research that shows for young people 25 and under with a brain that’s still changing, these devices are not an effective smoking **cessation** tool because you can get hooked to the nicotine that comes with it,” says one addiction specialist.

Nicotine-containing medications are a better aid for quitting. They deliver nicotine gradually and at very low levels.

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**DEFINITIONS**

**BLACK-MARKET**: to do with goods bought and sold illegally

**CESSATION**: an end to something

**HARM REDUCTION**: practical strategies and ideas aimed at reducing negative consequences associated with drug use
ON THE LINES

Answer the following in complete sentences:

1. Explain what nicotine is.

2. What are the two parts of an e-cigarette?

3. Describe how an e-cigarette works.

4. What is the biggest difference between regular cigarettes and e-cigarettes?

5. What did many people think of e-cigarettes when they were first introduced?

6. What warnings regarding e-cigarettes did health authorities recently issue? Why did they do this?

7. Describe the symptoms of those who are affected.

8. What is the suspected cause of this new illness?
SCIENCE, TECHNOLOGY, AND THE ENVIRONMENT

TEEN VAPING ON THE RISE

BETWEEN THE LINES

An inference is a conclusion drawn from evidence. A plausible inference is supported by evidence in the article and is consistent with known facts outside of the article.

What inference(s) can you draw from the fact that over the past 50 years, the number of Canadians who regularly smoke cigarettes has shrunk to about 16 percent?

JUST TALK ABOUT IT

1. What are the benefits of e-cigarettes? What are the drawbacks? As you see it, is the availability of e-cigarettes more of a benefit or more of a drawback? Explain.

2. What reasons can you suggest to explain why teen vaping rates are rising? Explain.

3. If you were the premier of a Canadian province, what regulations (if any) would you place on the e-cigarette industry? Who could buy e-cigarettes? What could be in them? Where could they be used? How could they be advertised? How would you justify your regulations? (If you would keep the industry unregulated as is currently the case, please explain this decision.)

ONLINE

Note: The links below are listed at www.lesplan.com/en/links for easy access.


2. View the results of the 2016 Canadian Student Tobacco, Alcohol, and Drugs Survey at https://uwaterloo.ca/canadian-student-tobacco-alcohol-drugs-survey/ (scroll down to ‘Provincial data on youth e-cigarette use’ to view factsheets by province).

3. Watch a video interview with Simah Herman at https://www.youtube.com/watch?v=LIyzUVfJpN4 [8:24]. Simah became an anti-vaping advocate after surviving a severe lung illness that caused her to be placed in a medically induced coma.


INFOGRAPHIC

Respond to the infographic on the following page. What information conveyed in the infographic is new to you? What is interesting to you? What seems to be especially significant? Why? Overall, how does the information in this infographic enhance your understanding of vaping around the world? Explain. ★