

## Section 2.

# Understanding vape products and cigarettes

Vaping and smoking are similar in that they both involve a substance being heated up so that the "smoke" that results can be inhaled into the lungs.

### Cigarettes

A cigarette contains dried and shredded leaves of the tobacco plant, along with many other chemical additives. When a cigarette is lit, the tobacco burns to create smoke.

Each cigarette has more than 600 ingredients. When a cigarette burns, the heat can cause new chemicals to form. Cigarette smoke contains more than 5,000 different chemicals. One of these substances is tar. Particles of this sticky, brown substance are so small that they pass through the filter of the cigarette and into the lungs. Tar is what stains smokers' fingers and teeth. It also contains more than 40 different substances that are known to cause cancer in humans.

### Vaping devices

Vaping devices (or "vapes") are sometimes called e-cigarettes, vapourizers, vape pens, mods, tanks, cigalikes, pods, e-hookahs or hookah pens.

A vape is an electronic device that uses a battery to heat up a liquid (e-liquid) that is in a tank or pod inside the device. When the liquid is heated up, it becomes an aerosol (a mixture of a gas and fine particles) that can be inhaled into the lungs. One of the things about vaping that makes it appealing for young people is that e-liquid comes in thousands of different flavours, including many fruit and candy flavours.

The basic parts of any vaping device are:

- the mouthpiece,
- the battery,
- the coil (the heating element) and
- the e-liquid tank or container.

Vaping devices come in a range of shapes, colours and sizes. Some have rechargeable batteries and refillable tanks, some come prefilled and pre-charged and are meant to be thrown away when empty. Some have larger batteries and tanks and are marketed to "advanced" vapers, and some are intended to be small so it's hard to see when they're being used.



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### Nicotine

Vaping products do not contain tobacco but most, but not all, vapes or e-liquid contains nicotine. Nicotine is the chemical that makes cigarettes and vaping so addictive. Nicotine occurs naturally in the tobacco plant. Nicotine acts as a plant's defense system, helping keep insects and herbivores from eating its leaves. Nicotine was actually one of the first insecticides used in agriculture. Nicotine-based insecticides are banned in Canada because they are very harmful to bees and other insects that are important for the ecosystem.

### The chemistry of vaping

Vegetable glycerin and propylene glycol are both ingredients in e-liquid. Propylene glycol is a synthetic (not found in nature) food additive. It is also (used as an antifreeze (but it is not to be confused with the antifreeze ethylene glycol, which is highly poisonous). Vegetable glycerin is made from plant oils. It is used in both cosmetics and food.

Both propylene glycol and vegetable glycerin are liquids that are described on vaping sites as “food safe”. But beware! “Food safe” only applies when these liquids are added to food and ingested, not heated to high temperatures and inhaled into the lungs.

In addition to what's listed on the label, many new chemicals are produced when the e-liquid is heated. Some of these new compounds are known to cause cancer and other diseases in humans.

### Vapour versus aerosol

One of the biggest myths about vaping is that it's not harmful because it's just water vapour and flavour. But the truth is, there is no actual “vapour” in vaping.

Just like with cigarettes, clever marketing and buzzwords can give the impression that vaping is not that big of a deal. The words “vaping” and “vapor” suggest that what's being inhaled when vaping is harmless water vapor. What vaping devices actually produce is an aerosol — a mixture of tiny liquid particles suspended in a gas.

When you vape, you're heating known and unknown chemicals to high temperatures to create an aerosol and inhaling that aerosol directly into the lungs.

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### There's nothing "green" about smoking or vaping

What else do smoking and vaping have in common? You probably know that smoking cigarettes is bad for you. You may even know that vaping is also very bad for your health. But you may not know that both cigarettes and vaping devices are also very bad for the environment.

#### Cigarette butts

Cigarette butts make up a big portion of the litter we see on the ground. In fact, every year in Canada, more than 8,000 tonnes are thrown on the ground (that's as much as 2,000 African elephants!). This is a problem because the filters are made out of a plastic material that can take years to break down. Research has also shown there are no health benefits of smoking cigarettes with filters compared to cigarettes without filters.

#### Vaping waste

When you throw a vaping device away, you're throwing out electronic waste, toxic waste and single-use plastic.

The plastic components of vaping devices will eventually break down (after hundreds of years) into microplastics, which can accumulate in and damage cells of living organisms. Disposable vaping devices create a lot of plastic waste every year. They cost less than refillable devices; this makes them especially popular with younger people. Some places, such as the United Kingdom, have banned the sale of disposable vapes.

Vaping devices use lithium batteries to create heat. Lithium is a non-renewable resource that is also used in batteries for electric cars or e-bikes. Lithium batteries can also be flammable, and discarded vapes have caused fires in garbage bins and at waste facilities.

Heavy metals in vaping devices, like nickel, cadmium, lead and mercury, are considered toxic waste. They can leech into water and soil.



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