

BRAIN BLAST



Empowering Youth to
DECIDE



Name: _____

This Brain Blast Notebook belongs to:

Name: _____

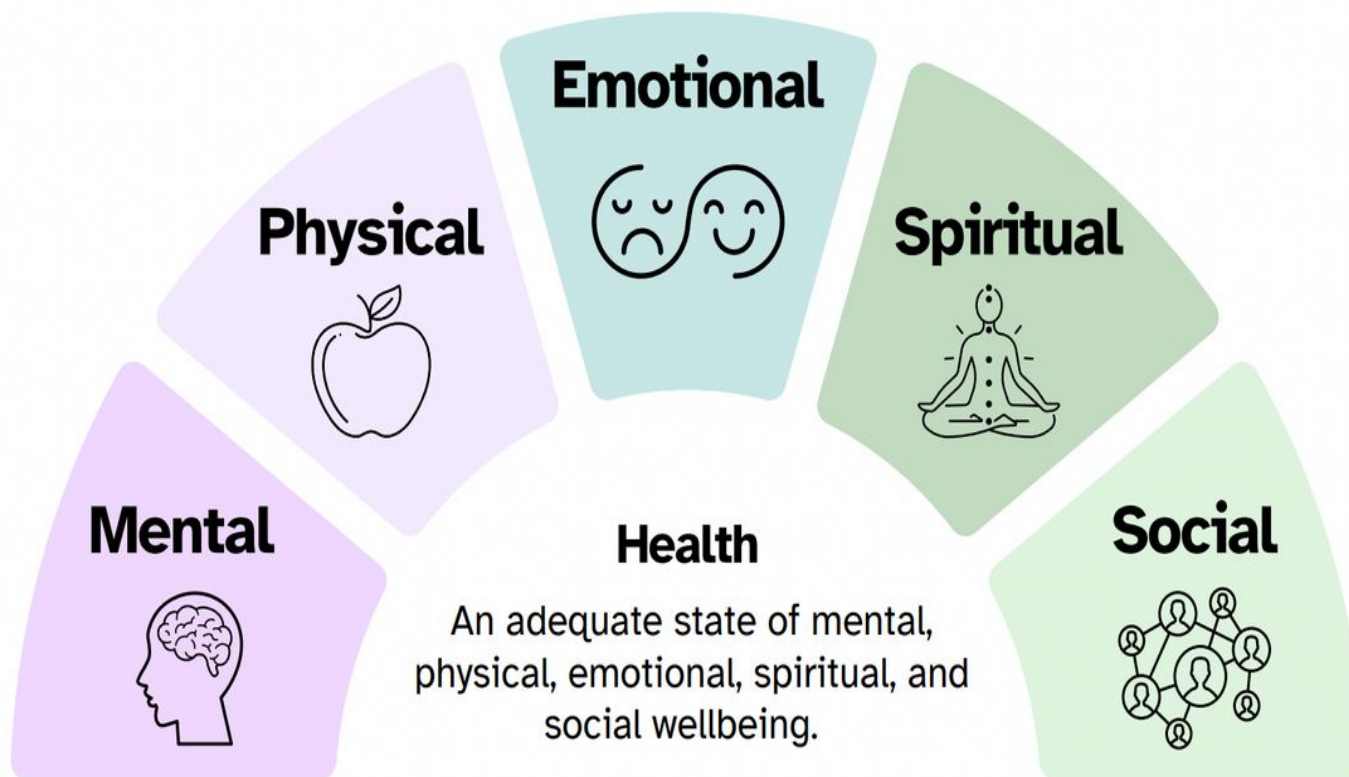
On this learning investigation
with your class, you will...

- Evaluate the connection between substance use and brain development.
- Analyze the effects of substance use on health and well-being.
- Explore harm reduction strategies for safer substance use.
- Identify lower risk use strategies when using various substances including alcohol, nicotine, cannabis, cocaine, methamphetamine (crystal meth), and ecstasy (MDMA).

HEALTHY HABITS

Health & Wellness

Refer to the health and [wellness infographic](#) for more details.



Wellness:
The behaviours, activities, and choices that promote health.



HEALTHY HABITS

Consider each component of health and wellness - **mental, physical, emotional, spiritual, and social.**

For each, identify a specific example of a healthy habit that can protect brain health and explain why how it relates to brain health.

Mental Health and Wellness

One healthy habit:	How this habit protects brain health:

Physical Health and Wellness

One healthy habit:	How this habit protects brain health:

Emotional Health and Wellness

One healthy habit:	How this habit protects brain health:

Spiritual Health and Wellness

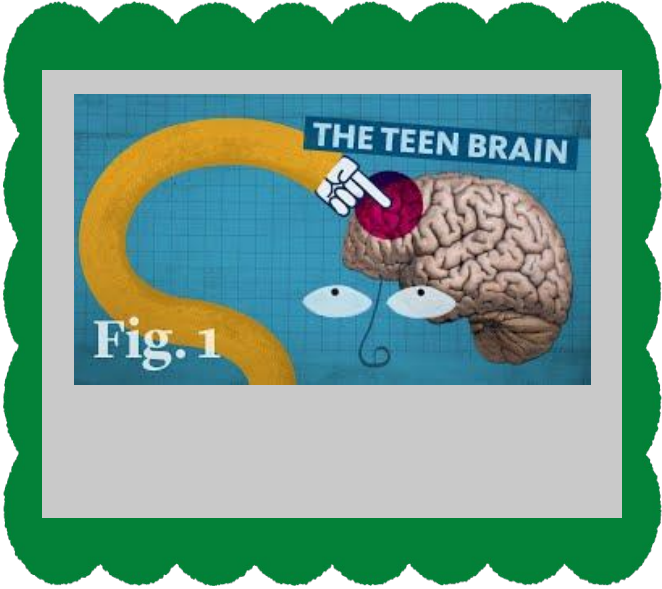
One healthy habit:	How this habit protects brain health:

Social Health and Wellness

One healthy habit:	How this habit protects brain health:

LOOK & LISTEN

Watch the video “Why the Teenage Brain Has Evolutionary Advantage” and respond to the following questions.



1. At what age are you considered an adult? _____

2. When does the brain stop developing? _____

3. What is the role of the prefrontal cortex?

4. What is the limbic system responsible for?

5. Which develops more rapidly, the prefrontal cortex or the limbic system?

6. Give an example of how the teenage brain is more effective than the adult brain.

7. What is an example of a healthy risk?

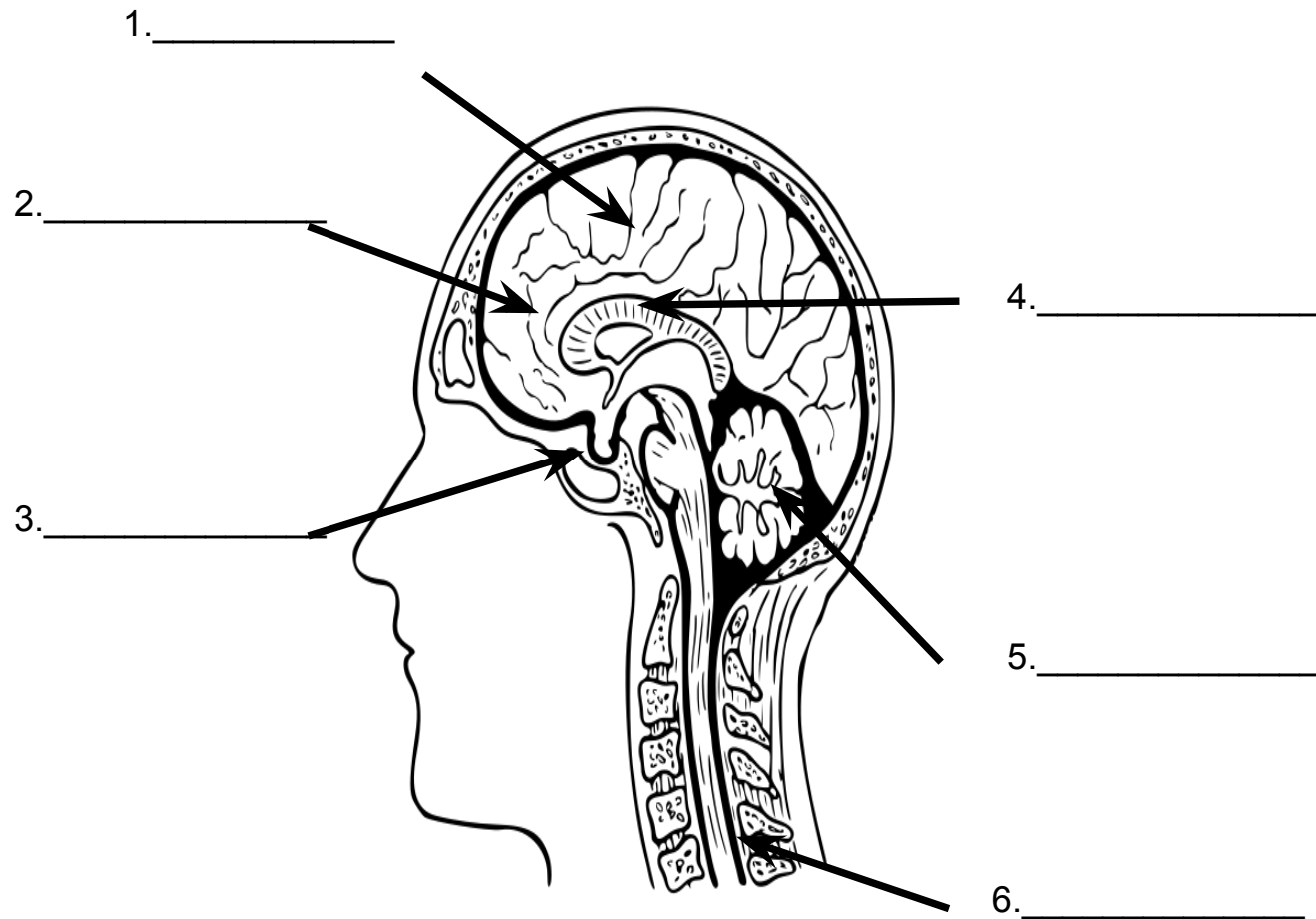
LOOK & LISTEN

Watch the video “Why the Teenage Brain Has Evolutionary Advantage” and respond to the following questions.

8. Using the internet, a textbook, or another source of information, colour and label the other parts of the nervous system in the diagram.

Word Bank

- a) corpus callosum
- b) prefrontal cortex
- c) cerebellum
- d) spinal cord
- e) amygdala
- f) frontal lobe

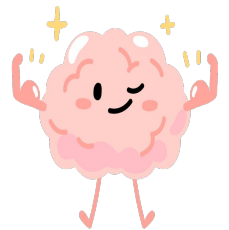




SHARING AND REFLECTION

Reflect on your healthy habits related to your brain health. Capture 3 ways that you are currently protecting and promoting your brain health and 3 ways that you can improve your brain health. Select one of the following ways to express your ideas:

- Create an infographic
- Create a presentation
- Write a short story or poem
- Pick a song and change the lyrics





SHARING AND REFLECTION



LOOK & LISTEN

Watch the video "[How Addiction Affects the Brain](#)" and respond to the following questions.



1. Define Addiction.

2. Name 5 substances that can be addictive.

3. How does addiction affect the brain?

4. Define tolerance.

5. What are some symptoms of withdrawal?

LOOK & LISTEN

Watch the video "[How Addiction Affects the Brain](#)" and respond to the following questions.

6. Why are young people more vulnerable to addiction?

7. Can addiction be treated?

8. Who can you talk to if you have an addiction?

TRUE FALSE FIX

Discuss each statement with your partner and then decide if it is true or false, checking the appropriate box.

If false, correct and rewrite the statement to make it true.

1. Our brains are fully developed by age 16.	<input type="checkbox"/> True <input type="checkbox"/> False	2. Teenagers are typically more impulsive than adults (impulsivity means doing things suddenly without any planning and not considering the effects they may have).	<input type="checkbox"/> True <input type="checkbox"/> False

3. Substances we consume when we are teenagers have zero effects on our health as adults.	<input type="checkbox"/> True <input type="checkbox"/> False	4. Teenagers who use drugs have a greater likelihood of having substance use disorders as adults.	<input type="checkbox"/> True <input type="checkbox"/> False

TRUE FALSE FIX

5. Addiction always involves substance use.	<input type="checkbox"/> True <input type="checkbox"/> False	6. Drinking alcohol when we're teenagers can affect our current mental health and future mental health.	<input type="checkbox"/> True <input type="checkbox"/> False
7. The only time alcohol affects our memory is when we drink too much at one time.	<input type="checkbox"/> True <input type="checkbox"/> False	8. Since cannabis is legal for adults in Canada, it means it is safe for teenagers to consume.	<input type="checkbox"/> True <input type="checkbox"/> False
9. Cannabis helps people focus.	<input type="checkbox"/> True <input type="checkbox"/> False	10. Cannabis is addictive.	<input type="checkbox"/> True <input type="checkbox"/> False

TRUE FALSE FIX

11. Vaping nicotine is only harmful to your body, not the brain.

- True
 False

12. Teenagers who vape nicotine or smoke cigarettes are more likely to continue using nicotine as adults.

- True
 False

13. It's ok to take someone else's prescription medication to get high because it was prescribed by a doctor.

- True
 False

14. Inhaling substances you find at school or at home such as glue, aerosol sprays, or gasoline is dangerous for our health.

- True
 False

15. Using LSD (AKA acid) can cause effects on the brain that last into adulthood.

- True
 False

16. Everybody drinks caffeinated beverages such as coffee or energy drinks so they must be ok for my brain health.

- True
 False

TRUE FALSE FIX

17. Tolerance can lead to increased substance use.

- True
 False

18. Methamphetamine (AKA crystal meth) can cause major issues related to brain health and mental health.

- True
 False

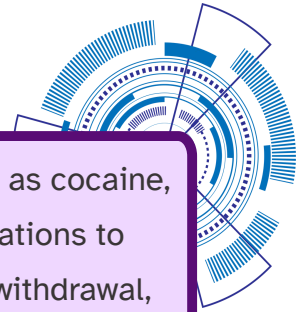
19. Withdrawal from a substance can include both physical and mental effects.

- True
 False

20. Deciding to delay drug and alcohol use until our brains are developed is the healthiest choice.

- True
 False

DRUG DATABASE



With your group, you will participate in a carousel activity to learn more about different substances such as cocaine, alcohol, cannabis, nicotine, methamphetamine (crystal meth) and ecstasy (MDMA). You will visit 6 stations to explore information about these substances including their effects; signs and symptoms of addiction, withdrawal, and tolerance; and how individuals may reduce the harm when using these drugs.

Using your Brain Blast notebook, consult the infographics available at each station and record what you learn.



COCAINE

- Substance Snapshots: [Stimulants](#); [Cocaine](#)
- [Substance Use Disorder](#)



ALCOHOL

- Substance Snapshots: [Depressants](#); [Alcohol](#)
- [Substance Use Disorder](#)



CANNABIS

- Substance Snapshots: [Cannabis](#); [Cannabis \(Inhaled\)](#), [Edible Cannabis](#), [Synthetic Cannabis](#)
- [Substance Use Disorder](#)



NICOTINE

- Substance Snapshots: Stimulants; [Nicotine \(Inhaled\)](#), [Nicotine Pouches](#)
- [Substance Use Disorder](#)



METHAMPHETAMINE

- Substance Snapshots: [Stimulants](#); [Methamphetamine](#)
- [Substance Use Disorder](#)



ECSTASY (MDMA)

- Substance Snapshots: [Hallucinogens](#); [Ecstasy](#)
- [Substance Use Disorder](#)

Cocaine

Depressant

Stimulant

Hallucinogen



DRUG DATABASE

What are the effects of cocaine?

Is cocaine addictive? If so, what are the signs of cocaine use disorder?

What are some harms of using cocaine?

Cocaine



What are ways someone can reduce harm when using cocaine?

What are some signs that someone has developed a tolerance to cocaine?

What are the signs and symptoms of cocaine withdrawal?

Alcohol

- Depressant*
- Stimulant*
- Hallucinogen*



DRUG DATABASE

How does alcohol affect the brain and body?

What are the some signs of alcohol use disorder?

How can alcohol use disorder harm the brain and body?

Alcohol



DRUG DATABASE

What are some ways someone can reduce harm when consuming alcohol?

How can you tell if someone is developing a tolerance to alcohol?

What signs might you notice in a person withdrawing from alcohol?

Cannabis

DRUG DATABASE

- Depressant*
- Stimulant*
- Hallucinogen*



What are the effects of cannabis use?

What are the some signs of cannabis use disorder?

What are the harms of cannabis use disorder?

Cannabis



What are some ways someone can reduce harm when consuming cannabis?

How can you tell someone is developing a tolerance to cannabis?

What are the symptoms of cannabis withdrawal?

Nicotine

Depressant

Stimulant

Hallucinogen



What are the effects of nicotine?

How can you tell if someone has a nicotine use disorder?

What are the harms of nicotine use disorder?

Nicotine

DRUG DATABASE

What are some ways to reduce harm when using nicotine?

What are the signs someone is developing a tolerance to nicotine?

What are the symptoms of nicotine withdrawal?

Methamphetamine

DRUG DATABASE

Depressant

Stimulant

Hallucinogen



What are the effects of methamphetamine?

Is methamphetamine addictive? If so, what are the signs of methamphetamine use disorder?

What are the harms of methamphetamine use disorder?

Methamphetamine



DRUG DATABASE

What are some ways to reduce harm associated with methamphetamine?

What are the signs someone is developing a tolerance to methamphetamine?

What signs might you notice in a person withdrawing from methamphetamine?

Ecstasy

DRUG DATABASE

- Depressant*
- Stimulant*
- Hallucinogen*



What are the effects of using ecstasy?

Is ecstasy addictive? What are some signs of ecstasy use disorder?

What are the harms associated with ecstasy use disorder?

Ecstasy



DRUG DATABASE

How can people reduce harms when using ecstasy?

What are the signs someone has developed a tolerance to ecstasy?

What might you notice in a person who is withdrawing from ecstasy?



SHARING AND REFLECTION

1. Why should young people delay the use of drugs and alcohol? Be sure to support your answer using information you learned about brain health and addiction .

2. What is withdrawal and what role does it play in addiction?



SHARING AND REFLECTION

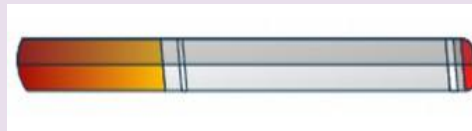
3. What is drug tolerance? Choose one of these drugs—cocaine, cannabis, alcohol, nicotine, methamphetamine (crystal meth), or ecstasy—and explain how tolerance works with that drug.

CALCULATING SUBSTANCES: NICOTINE

Calculate the amount of **nicotine** in different products and compare to a package of cigarettes

How much nicotine is in a cigarette?

One cigarette delivers 1 mg of nicotine to the brain.



One pack of cigarettes delivers 20 mg of nicotine to the brain.



CALCULATING SUBSTANCES: NICOTINE

Calculate the amount of **nicotine** in different products and compare to a package of cigarettes

How to calculate how much nicotine is in a product?

- Read the label to see the container volume (mL or g) and concentration.
- Some common nicotine products and their concentrations:
 - E-liquid (vape): 20mg of nicotine per mL
 - Nicotine pouches: 6mg of nicotine per pouch
 - Smokeless tobacco (chewing tobacco): 2.5g of nicotine per gram
- To determine how many packages of cigarettes are equivalent, divide amount of nicotine by 20mg
- Calculate the amount of nicotine in the product using this formula:

container volume x nicotine concentration = total nicotine

- Finally, to determine how many packages of cigarettes are equivalent, divide amount of nicotine by 20mg.

Example of a 34g can of chewing tobacco:

Container Volume = 34g

Concentration = 2.5mg/g

$34g \times 2.5mg/g = 85mg$ of nicotine

$85mg / 20mg = 4.25$ packs of cigarettes

CALCULATING SUBSTANCES: NICOTINE

Test Your Knowledge:

Consider the following series of nicotine products and calculate how many packages of cigarettes each product is equivalent to.

Vape Product A



Product contains 2 mL of E-Liquid
Each mL of E-Liquid contains 20 mg of nicotine.

Which has more nicotine? Vape Product A or a package of cigarettes?

Calculation:

Total amount in vape: _____

Equivalent to number of cigarette packages: _____

Which has more alcohol?

- Vape Product A 1 package of 20 cigarettes (20 mg)

Vape Product B



Product contains about 5 mL of E-Liquid
Each mL of E-Liquid contains 20 mg of nicotine.

Which has more nicotine? Vape Product B or a package of cigarettes?

Calculation:

Total amount in vape: _____

Equivalent to number of cigarette packages: _____

Which has more alcohol?

- Vape Product B 1 package of 20 cigarettes (20 mg)

CALCULATING SUBSTANCES:

NICOTINE

Vape Product C



Product contains 13 mL of E-Liquid
Each mL of E-Liquid contains 20 mg of nicotine.

Which has more nicotine? Vape Product C or a package of cigarettes?

Calculation:

Total amount in vape: _____

Equivalent to number of cigarette packages: _____

Which has more alcohol?

- Vape Product B 1 package of 20 cigarettes (20 mg)

Nicotine Pouch Product



Product contains 6 mg of nicotine per pouch and there are 15 pouches in a package.

Which has more nicotine? Nicotine Pouch Product or a package of cigarettes?

Calculation:

Total amount in nicotine pouches: _____

Equivalent to number of cigarette packages: _____

Which has more alcohol?

- Nicotine Pouch Product 1 package of 20 cigarettes (20 mg)

CALCULATING SUBSTANCES: ALCOHOL

Calculate the amount of **alcohol** in different products by using the **standard drink** equation

What is a standard drink?

A Canadian standard drink contains 17.05mL of pure ethanol. It's easy to measure your alcohol use by counting your “standard drinks”.



BEER/CIDER/COOLER
341mL (12oz)
5% alcohol content

WINE
142mL (5oz) glass
12% alcohol content

DISTILLED ALCOHOL
(rum, vodka, gin, etc)
43mL (1.5oz) glass
40% alcohol content

Alcohol strengths may vary from product to product so check the % of alcohol by volume listed on the container.

CALCULATING SUBSTANCES: ALCOHOL

Calculate the amount of **alcohol** in different products by using the **standard drink** equation

How to calculate how many standard drinks are in a product?

- The type of alcohol does not matter. Look at the alcohol % and the volume.
- Read the label to see the alcohol % for the type of alcohol (e.g. 5%, 7%, 12%, 40%, etc.).
- Look for the container volume (e.g. 340mL, 500mL, 750mL, etc.).
- Calculate the amount of alcohol in the drink using this formula:

$$(\%/100) \times \#mL = \text{amount of alcohol}$$

Amount of alcohol divided by 17 = total number standard drinks

Example of a 341mL bottle of 3.7% beer:

$$\text{Alcohol \%} = 3.7\%$$

$$\text{Volume} = 341\text{mL}$$

$$3.7\% / 100 = 0.037$$

$$341 \text{ mL} \times 0.037 = 12.6 \text{ mL}$$

$$12.6\text{mL} / 17 = 0.7 \text{ Canadian standard drinks}$$

CALCULATING SUBSTANCES: ALCOHOL

Test Your Knowledge:

Consider the following series of drinks and calculate how many standard drinks each drink is equivalent to.

Cooler



Product contains 355mL of 7%

Which has more alcohol? One 355mL can of 7% cooler or one standard drink?

Calculation:

Equivalent to number of Canadian standard drinks: _____

Which has more alcohol?

- 355mL of 7% cooler
- 1 standard drink

cooler Beer



Product contains 500mL of 5% beer

Which has more alcohol? One 500mL can of 5% beer or one standard drink?

Calculation:

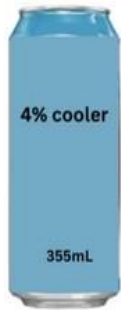
Equivalent to number of Canadian standard drinks: _____

Which has more alcohol?

- 500mL of 5% beer
- 1 standard drink

CALCULATING SUBSTANCES: ALCOHOL

Cooler



Product contains 355mL of 4% cooler

Which has more alcohol? One 355mL can of 4% cooler or one standard drink?

Calculation:

Equivalent to number of Canadian standard drinks: _____

Which has more alcohol?

- 355mL of 4% cooler
- 1 standard drink

Wine



Product contains 750mL of 12% wine

Which has more alcohol? One 750mL bottle of 12% wine or one standard drink? Calculation:

Equivalent to number of Canadian standard drinks: _____

Which has more alcohol?

- 750mL of 12% wine
- 1 standard drink

CALCULATING SUBSTANCES: ALCOHOL

Vodka



Product contains 90mL (2 shots) of 40% vodka

Which has more alcohol? 90mL of 40% vodka or one standard drink?

Calculation:

Equivalent to number of Canadian standard drinks: _____

Which has more alcohol?

- 90mL of 40% vodka
- 1 standard drink

Glass of Wine



Product contains 100mL of 14% wine

Which has more alcohol? One 100mL glass of 14% wine or one standard drink? Calculation:

Equivalent to number of Canadian standard drinks: _____

Which has more alcohol?

- 100mL of 14% wine
- 1 standard drink

CALCULATING SUBSTANCES: ALCOHOL

Sour Puss



Product contains 250mL of 15% Sour Puss

Which has more alcohol? 250mL of 15% Sour Puss or one standard drink? Calculation:

Equivalent to number of Canadian standard drinks:

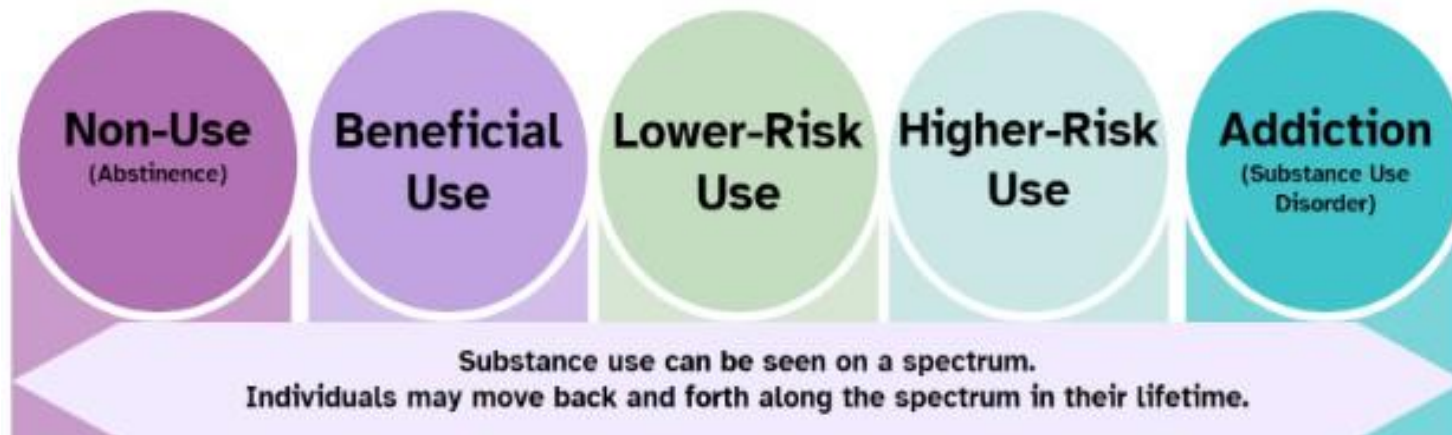
Which has more alcohol?

- 250mL of 15% Sour Puss
- 1 standard drink

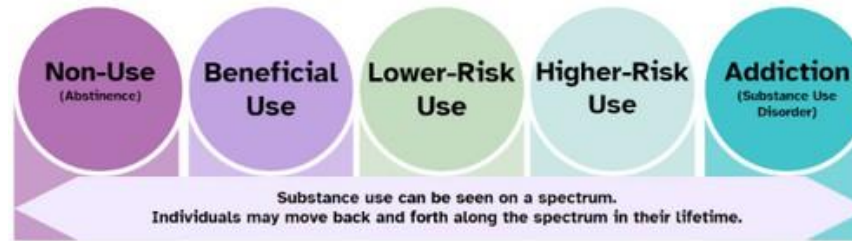
You can also use this online calculator to convert your drinks into Canadian standard drink sizes: <http://aodtool.cfar.uvic.ca/index-stddt.html>

SUBSTANCE USE SPECTRUM

Read each situation and decide where it falls on the substance use spectrum. If the situation describes higher-risk use or substance use disorder (addiction), try to identify at least two possible ways to lower risk. You can refer to the [substance use spectrum infographic](#) for examples.



SUBSTANCE USE SPECTRUM



1. Mikael drives his ATV home after having several beers at his friend's shed.

Spectrum: Non-Use Beneficial Use Lower-Risk Use Higher-Risk Us Addiction

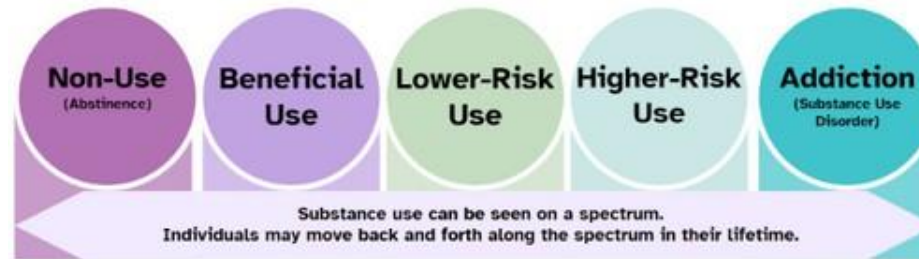
Ways to lower risk:

2. Willow has chronic pain and was prescribed a CBD product by her doctor. Willow takes the CBD as prescribed and finds that it helps with her pain a lot.

Spectrum: Non-Use Beneficial Use Lower-Risk Use Higher-Risk Us Addiction

Ways to lower risk:

SUBSTANCE USE SPECTRUM



3. Annika saw her favourite social media influencer advertising caffeine pills as a way to improve energy and focus. Annika has been using caffeine pills to stay up late and play video games with friends.

Spectrum: Non-Use Beneficial Use Lower-Risk Use Higher-Risk Us Addiction

Ways to lower risk:

4. Cori started vaping nicotine a few months ago. Recently, Cori has been vaping more and more often, experiencing cravings, and feels anxious and irritable when she cannot vape.

Spectrum: Non-Use Beneficial Use Lower-Risk Use Higher-Risk Us Addiction

Ways to lower risk:

SUBSTANCE USE SPECTRUM



5. Nico drinks a glass of water in between every alcoholic drink he has at his grad party.

Spectrum: Non-Use Beneficial Use Lower-Risk Use Higher-Risk Us Addiction

Ways to lower risk:

6. Jen became interested in trying MDMA after hearing about it at school. Jen bought MDMA from another student at school and is going to try it alone in her room.

Spectrum: Non-Use Beneficial Use Lower-Risk Use Higher-Risk Us Addiction

Ways to lower risk:

SUBSTANCE USE SPECTRUM



7. Amy's friends are planning to drink on Friday night, but she is taking antibiotics. Amy decides not to drink as she knows that combining substances can be dangerous.

Spectrum: Non-Use Beneficial Use Lower-Risk Use Higher-Risk Us Addiction

Ways to lower risk:

8. Lucy left her drink on the table when she was at a house party when she went to the bathroom. She continues drinking it when she gets back to the table.

Spectrum: Non-Use Beneficial Use Lower-Risk Use Higher-Risk Us Addiction

Ways to lower risk:

SUBSTANCE USE SPECTRUM



9. Nathan has ADHD and is prescribed methylphenidate (Concerta) by his doctor, which really helps him focus in school.

Spectrum: Non-Use Beneficial Use Lower-Risk Use Higher-Risk Us Addiction

Ways to lower risk:

10. Penny didn't eat all day and started drinking with her friends on an empty stomach.

Spectrum: Non-Use Beneficial Use Lower-Risk Use Higher-Risk Us Addiction

Ways to lower risk:

SUBSTANCE USE SPECTRUM



11. Cooper uses cannabis to manage their anxiety. They took a cannabis gummy around 5pm. Two hours later, Cooper drives their little sister to their grandparent's house.

Spectrum: Non-Use Beneficial Use Lower-Risk Use Higher-Risk Us Addiction

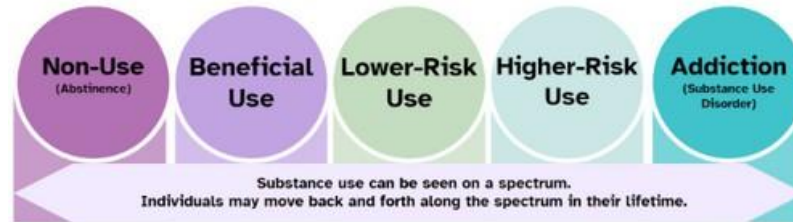
Ways to lower risk:

12. Micha is with some friends who regularly drink on the weekends. Micha is an inexperienced drinker. When offered a shot, Micha declines as they want to pace themselves and stick to drinking low-alcohol beer.

Spectrum: Non-Use Beneficial Use Lower-Risk Use Higher-Risk Us Addiction

Ways to lower risk:

SUBSTANCE USE SPECTRUM



13. Aaron is intoxicated from alcohol, so his friends lay him on his back on a bed so he can sleep it off.

Spectrum: Non-Use Beneficial Use Lower-Risk Use Higher-Risk Us Addiction

Ways to lower risk:

14. Lucy has a really bad headache. Her friend has prescription pills for migraines and offers Lucy one. Lucy says no, as she is unsure how the medication will affect her.

Spectrum: Non-Use Beneficial Use Lower-Risk Use Higher-Risk Us Addiction

Ways to lower risk:

SUBSTANCE USE SPECTRUM



15. Jesse's family has a history of substance use problems. As a result, Jesse limits his alcohol use to special occasions and never has more than one alcoholic beverage at any given time.

Spectrum: Non-Use Beneficial Use Lower-Risk Use Higher-Risk Us Addiction

Ways to lower risk:

16. Mel's grandmother recently passed away, and she is having a hard time coping. Mel has started drinking alcohol daily to numb her feelings. Mel now experiences headaches and irritability when she does not drink alcohol.

Spectrum: Non-Use Beneficial Use Lower-Risk Use Higher-Risk Us Addiction

Ways to lower risk:

SUBSTANCE USE SPECTRUM



17. Maria has anxiety and takes antidepressants that her family doctor prescribed to her. Since taking this medication, Maria's mental health has improved a lot.

Spectrum: Non-Use Beneficial Use Lower-Risk Use Higher-Risk Us Addiction

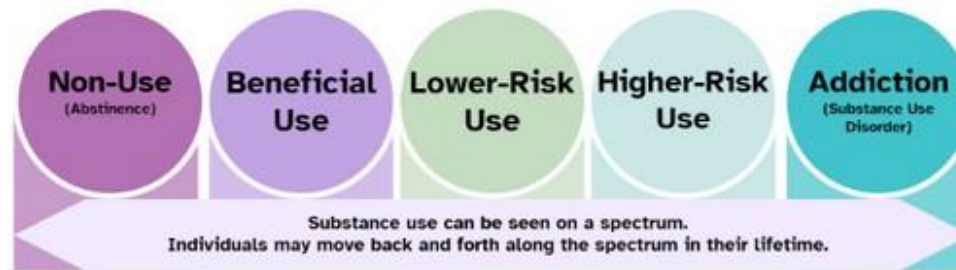
Ways to lower risk:

18. Stefan swallowed a pill that someone gave him at a field party. He is now feeling drowsy, dizzy, and confused. Stefan decides to walk home alone as he only lives a few blocks away.

Spectrum: Non-Use Beneficial Use Lower-Risk Use Higher-Risk Us Addiction

Ways to lower risk:

SUBSTANCE USE SPECTRUM



19. Theo has had trouble sleeping lately because they are stressed about their parent's separation. They smoke cannabis every night to get to sleep. Theo can no longer sleep without cannabis and craves it throughout the day.

Spectrum: Non-Use Beneficial Use Lower-Risk Use Higher-Risk Us Addiction

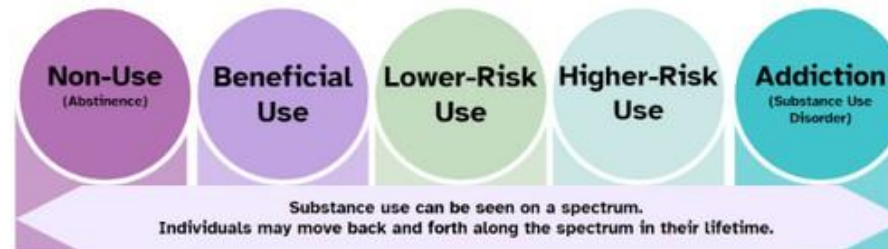
Ways to lower risk:

20. Hillary and her friends take ecstasy at a house party. No one at the party has a naloxone kit.

Spectrum: Non-Use Beneficial Use Lower-Risk Use Higher-Risk Us Addiction

Ways to lower risk:

SUBSTANCE USE SPECTRUM



21. Miya has been drinking with friends but is getting tired. Her friend offers her cocaine, saying that it will give her lots of energy to stay out and have fun. Miya declines, as she is worried about the risks of mixing substances.

Spectrum: Non-Use Beneficial Use Lower-Risk Use Higher-Risk Us Addiction

Ways to lower risk:

22. Shea is feeling a lot of pressure from her parents to keep her grades up. She is drinking energy drinks and using nicotine pouches to focus while she studies for a test.

Spectrum: Non-Use Beneficial Use Lower-Risk Use Higher-Risk Us Addiction

Ways to lower risk:

SUBSTANCE USE SPECTRUM



23. Will bought vape juice from a random website he found on social media.

Spectrum: Non-Use Beneficial Use Lower-Risk Use Higher-Risk Us Addiction

Ways to lower risk:

24. Layla takes several shots of tequila over the course of an hour.

Spectrum: Non-Use Beneficial Use Lower-Risk Use Higher-Risk Us Addiction

Ways to lower risk:

SUBSTANCE USE SPECTRUM



25. Emil's older brother took crystal meth (methamphetamine) to stay awake during an overnight shift.

Spectrum: Non-Use Beneficial Use Lower-Risk Use Higher-Risk Us Addiction

Ways to lower risk:



SHARING AND REFLECTION

Pick one of the following substances: alcohol, cocaine, cannabis, nicotine, methamphetamine (crystal meth), or ecstasy (MDMA). In pairs or individually, you will present to the class at least 5 lower risk approaches or harm reduction strategies about the substance. Students will present their findings to class in a 5-minute presentation.

You may pick one of these methods for sharing with the class:

- presentation slides
- poster
- infographic
- video
- skit
- poem
- other creative approach



SHARING AND REFLECTION

CONGRATULATIONS!

***YOU HAVE COMPLETED THE BRAIN BLAST
BOOKLET***



Empowering Youth to
DECIDE

