



Substance Misuse

BIOLOGY • HEALTHY LIVING • SUBSTANCE MISUSE

Section 1: Cigarettes and Alcohol

• What is a legal drug?

A drug is any substance that changes the way your body or mind works. Drugs can be divided broadly into two categories – legal and illegal. Legal drugs refer to those used medicinally, for example, acetylsalicylic acid (found in aspirin) or those used recreationally, for example, caffeine (found in coffee).

Whether or not a drug is legal differs from country to country. You can buy alcohol in the UK if you are over the age of 18, but it is banned in some Middle Eastern countries. Even if a drug is legal, it does not mean that it cannot harm you. Most prescription drugs have a range of side-effects associated with their use and some can be addictive. However, legal medicinal drugs are designed to improve the health of the user and so their benefits outweigh their risks.

Legal recreational drugs, such as alcohol, also carry risks and can cause a great deal of harm to your body if they are not used in moderation. Some people can form an addiction to legal drugs.



Most prescription drugs have a range of side-effects associated with their use

• Suggested Film

- Harmful Drugs

• How does alcohol affect your health?

Alcohol is made by fermenting grains, fruit or vegetables, and is a common legal drug in the UK. Alcohol is widely used socially because in small amounts it can make you feel happy and relaxed.

Alcohol begins to affect the body as soon as you start to drink it. It passes easily through the wall of your stomach and intestines, entering the bloodstream. It is then circulated around your body, passing into nearly every tissue including those in your nervous system and brain.

Alcohol is a depressant not a stimulant, and as a result slows down your brain's functions. Your impaired motor control can cause you to slur your words, get confused easily, and find it hard to walk. Alcohol also makes you feel less inhibited, and although this may be seen as beneficial to those that are shy in social situations, drinking to excess can lead to risky or aggressive behaviour.

It is not just your nervous system which is affected by alcohol. Alcohol is a poison which, when taken in small amounts, is broken down by the liver before it can cause any damage to the body. If it is drunk in larger quantities over a short period of time, the liver is overwhelmed, leading to alcohol poisoning. The depressant effect of alcohol on the nervous system means you could stop breathing, your heart could stop beating, or you could choke on your own vomit, but you can also cause damage to your stomach, your mouth, your pancreas and your skin.



Alcohol is one of the most widely used drugs worldwide

Heavy drinkers can expect to suffer from a range of physical problems. Those that drink heavily for a number of years may do so because they are addicted to alcohol. Alcoholism leads to long-term brain and liver damage, and eventually death.

If alcohol was discovered today, it is very likely that it would be an illegal drug.

Extension Question

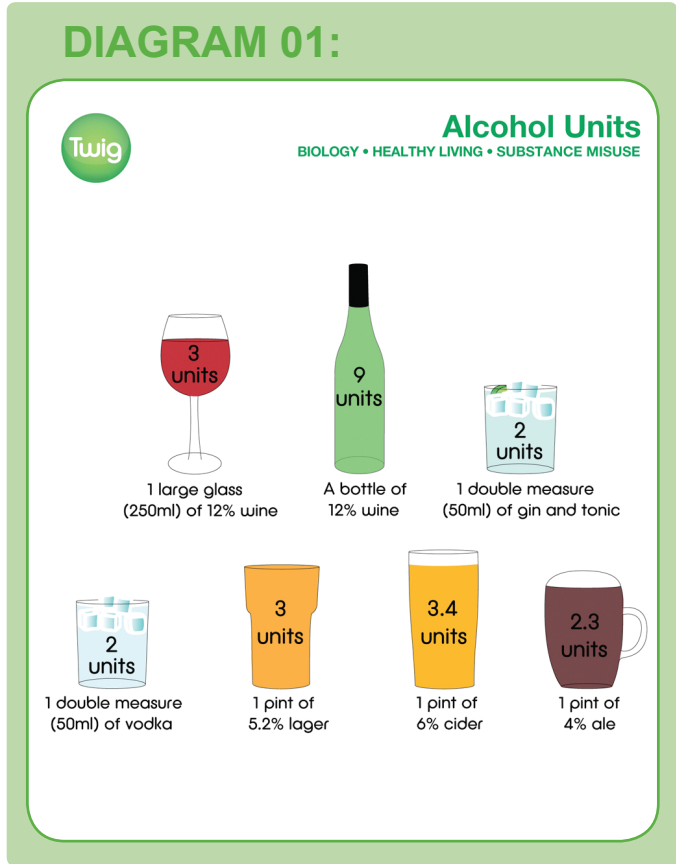
Q1. What is binge drinking?

Drinking a large amount of alcohol in a short space of time is considered binge drinking. The amount of alcohol that can be consumed safely by men and women differs due to their physiology. A man drinking three pints of strong beer in a short space of time could be considered a binge drinker, whereas for a women it could be drinking two pints of strong beer or two large glasses of wine in the same period of time.

• Suggested Films

- Alcohol and the Brain
- Alcohol: The Poison

DIAGRAM 01:



• How does smoking affect your health?



When burned, cigarettes release over 4000 different chemicals

Nicotine, the addictive drug found in cigarettes, is a natural poison produced by plants to stop insects eating them. Nicotine is a stimulant that increases brain activity and concentration, and makes the smoker feel calm and relaxed, but it also increases heart rate and blood pressure, causing the smoker to breath faster and less deeply.

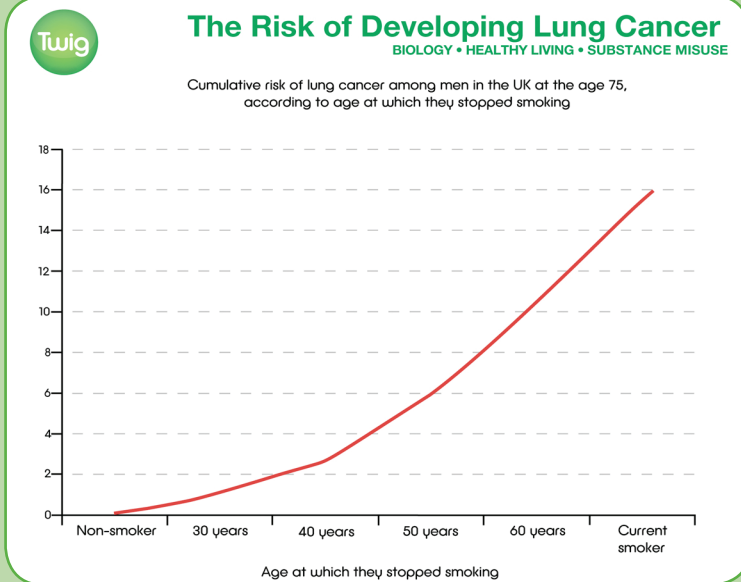
Cigarette smoke contains over 4000 chemicals. One of those chemicals is tar, a sticky black substance that builds up in the lungs, turning them from pink to grey. The tar damages the alveoli sacs; these form the boundary between the lungs and the blood vessels, and are where gas exchange takes place. The damage to the alveoli sacs can cause them to break down, leading to a respiratory condition called emphysema. Breathing becomes laboured and you cannot get enough oxygen into your body, limiting your mobility and life expectancy.

Tar is also a carcinogen (cancer-causing). Smoking directly causes more than 80% of cases of lung cancer. Unfortunately, it can be difficult to spot early-stage lung cancer, as it often grows with no obvious symptoms.

Smoking can also damage your circulatory system with chemicals from the cigarette smoke damaging the lining of blood vessels and making it more likely your blood vessels will become blocked. This can lead to heart disease, thrombosis and strokes.

If tobacco was discovered today, it is very likely that it would be an illegal drug.

DIAGRAM 02:



Extension Question

Q2. How does smoking affect pregnant women?

Cigarette smoke contains a poisonous gas called carbon monoxide. This gas reduces the amount of oxygen that can be carried in the blood. A pregnant woman who smokes will therefore prevent enough oxygen reaching the developing foetus. This increases the risk of a premature birth, a baby with a low birth mass, and miscarriage or stillbirth.

• Suggested Film

- What's in a Cigarette?

Section 2: Illegal Drugs

• What is an illegal drug?

A drug is any substance that changes the way your body or mind works. Drugs can be divided broadly into two categories – legal and illegal. Illegal drugs tend to be used recreationally, for example, heroin or cocaine, although some people use illegal drugs medicinally, for example, cannabis.

• Suggested Film

- Harmful Drugs

Extension Question

Those that support the legalisation of drugs in the UK argue that drug use is a personal choice and the state should not interfere. They also state that users are being stigmatised and criminalised by their activities, when in fact they should be offered help to break their addictions. Those against the legalisation of drugs say that the government has duty of care to its people and by keeping some drugs illegal, the government is potentially discouraging harmful behaviour. There is also concern that the legalisation of drugs will lead to greater consumption and therefore there will be an increase in the number of those seeking help to deal with the harmful effects associated with drug use.

• Why do people use drugs?

Some people will take drugs for excitement, escape or experimentation. Drugs can make the user feel good about themselves, or feel that their problems no longer matter. Peer-pressure can also play a part.

Different drugs have different effects. Some are stimulants which speed up the body, for example, ecstasy or cocaine. Others are depressants, which have the opposite effect and slow the body down, such as cannabis. People may want to engage with the world in an entirely different way and can do so by taking hallucinogens, which make the user see, hear or feel unusual things. Opiates, such as heroin, act as painkillers, allowing the user to stop feeling anything or detach from the world. Some opiates can also act as depressants or hallucinogens. Unfortunately, recreational drugs tend to be addictive and, eventually, users will have to take them to avoid suffering from withdrawal symptoms.



Cannabis is produced from a plant that grows naturally in the wild

Extension Question

Q4. How do drugs improve sports performance?

Some drugs can help improve sports performance by building up muscle mass, increasing red blood cell production and speeding up reactions. Random drug testing is an important and necessary part of competitive sports, with competitors being banned if they produce a positive test result.

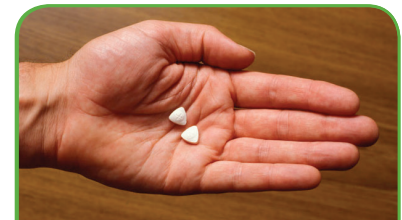
• Suggested Films

- Harmful Drugs: Cocaine
- Harmful Drugs: Heroin
- Harmful Drugs: LSD
- Harmful Drugs: Ecstasy
- Harmful Drugs: Cannabis

• What are the dangers of drug taking?

Different drugs have different effects and therefore there are different dangers associated with them. Stimulants can cause anxiety or panic attacks when taken in large quantities, while depressants affect coordination, increasing the likelihood of accidents. Hallucinogenic drugs can create very disturbing experiences leading to erratic or dangerous behaviour.

How a drug affects a user depends on factors such as the quantity, frequency and method of drug taking. Other factors include what other substances have been added to the drug to bulk it out, and what combination of drugs has been taken.



Ecstasy raises the heart rate and body temperature

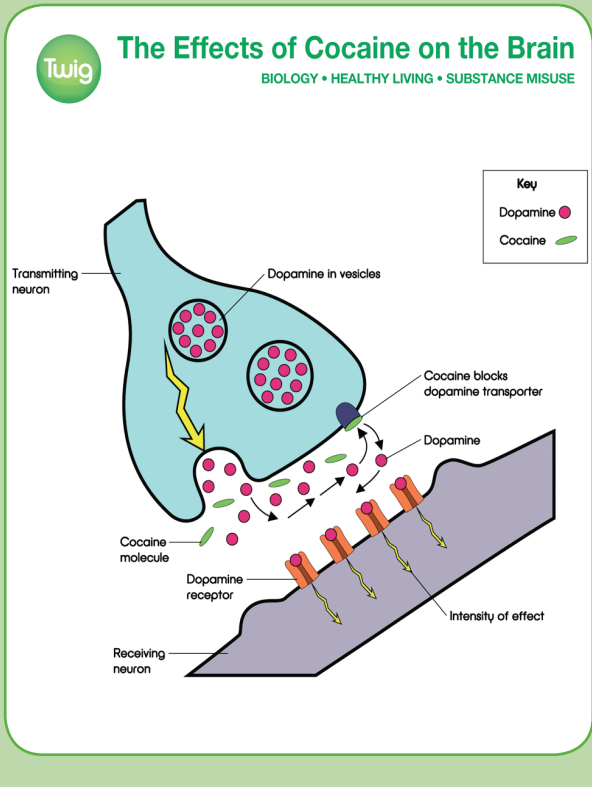
• Suggested Films

- Harmful Drugs: Cocaine
- Harmful Drugs: Heroin
- Harmful Drugs: LSD
- Harmful Drugs: Ecstasy
- Harmful Drugs: Cannabis

Section 3: Addiction

• What is addiction?

DIAGRAM 03:



If someone feels like they cannot live a full life without taking drugs, they are described as being drug dependent or having a drug addiction. An addiction arises from physiological (how the drug affects the brain) and psychological (the reasons for the taking the drug) needs and will usually take time to develop.



Neurons in the brain produce a hormone called dopamine when it experiences something pleasurable, such as the smell of food. The dopamine is detected by receptors and the transporters pick up any excess. Drugs such as cocaine block some transporters, prolonging the length of time the dopamine is picked up and increasing the length of pleasure sensation. Over time, the brain will physically

change to produce only small amounts of dopamine, so the individual finds it hard to experience pleasure normally without taking drugs.

Other drugs, such as cannabis or heroin, are able to activate receptors in the brain, causing them to send out abnormal messages. Over time, the brain will again physically change.

• Suggested Films

- Harmful Drugs: Cocaine
- Science of Addiction
- Drugs and the Brain

• Why do some people become addicts?

Scientists are still researching the reasons why some people can take drugs without becoming reliant on them, while others find it so hard to stop their use. Socioeconomic factors such as poverty and extreme stress are linked to drug addiction, while the high incidence of mental illnesses in addicts also suggests a possible relationship. Physiologically it would appear that some people are born with fewer dopamine receptors. The subsequent use of drugs would have a more profound effect on the amount of dopamine detected by the receptors. More often than not it is due to a complicated combination of physical, emotional and psychological factors.

• Suggested Film

- Science of Addiction

Extension Question

Q5. What treatments are available to drug addicts?

It is important that the treatment chosen for an individual drug addict deals with all aspects of that person's life, not just their drug addiction. The drug addict must be prepared to spend an appropriate amount of time being treated for it to have an effect. Options include:

- Counselling – in particular Cognitive Behavioural Therapy (CBT)
- Medication – to help deal with withdrawal symptoms
- Medication – to restore normal brain function
- Residential treatment programmes – this is sometimes referred to as 'going into rehab'

• What problems do addictions cause?

Drug addiction not only affects the addict, but also their friends, family and society. An addict may become so focused on their addiction that they neglect their work, which may result in them losing their job. An addict's relationship with their partner and children may also be affected. They may start to neglect themselves, leading to a greater risk of health problems. For example, the addict may become infected with a serious illness, such as hepatitis or HIV, from sharing needles when injecting drugs.



An addict may be unable to produce feelings of pleasure naturally and become physically dependent on drugs

• Quizzes

Alcohol and the Brain

Basic

- What is another chemical name for alcohol?
 - A – melanin
 - B – ethanol
 - C – heroin
 - D – dopamine

- Which is not an effect of drinking alcohol?
 - A – slurred speech
 - B – poor judgement
 - C – blurred vision
 - D – faster reactions

- How much alcohol, if injected, would be enough to kill a human being?
 - A – 0.19 millilitres
 - B – 2.9 millilitres
 - C – 19 millilitres
 - D – 29 millilitres

- On which group of people is alcohol believed to have a particularly striking effect, because of their brain development?
 - A – adolescents
 - B – middle-aged people
 - C – women
 - D – men

Advanced

- How long after drinking does alcohol start to affect the brain?
 - A – 1 minute
 - B – 5 minutes
 - C – 30 minutes
 - D – 1 hour

- Which mood-related chemicals in the brain is alcohol linked to?
 - A – serotonin and adrenaline
 - B – serotonin and dopamine
 - C – serotonin and insulin
 - D – adrenaline and dopamine

- Why could alcohol (in large enough doses) cause someone to stop breathing?
 - A – it increases confidence
 - B – it acts as an anaesthetic
 - C – it changes moods
 - D – it is addictive

- Why does alcohol affect memory?
 - A – because it kills brain cells, even in small doses
 - B – because it slows down reactions
 - C – because it causes serotonin to be released
 - D – because it can be addictive

Harmful Drugs

Basic

• What is the definition of a drug?

- A – a substance that is illegal
- B – a substance that our bodies need to survive
- C – a substance that cures illnesses
- D – a substance that affects chemical processes in our bodies

• Which is not a factor in deciding how dangerous a recreational drug is?

- A – direct effect on the body
- B – cost of the drug
- C – addictiveness
- D – risk of an overdose

• What is the name for the physical effects on an addict when they stop taking a drug?

- A – completion symptoms
- B – addition symptoms
- C – removal symptoms
- D – withdrawal symptoms

• What do cocaine, heroin, tobacco and alcohol have in common?

- A – they are all illegal
- B – they can be bought only by people over 18
- C – they are all addictive
- D – they all have the same effect on chemistry in the brain

Advanced

• Which is NOT a reason that medical drugs are safer than recreational drugs?

- A – they have been tested to ensure benefits outweigh negative effects
- B – they have to be taken strictly as advised
- C – they are legal
- D – they are designed to treat specific illnesses

• Which of the following statements is NOT true about recreational drugs?

- A – some have age limits
- B – all recreational drugs are illegal
- C – they are taken at an individual's own risk
- D – some are legal and some are illegal

• Why are addictive substances so dangerous?

- A – they are very expensive
- B – they are illegal in many countries
- C – they have few withdrawal symptoms
- D – they affect brain chemistry in a way we cannot control

• Which is NOT a withdrawal symptom from heroin?

- A – nausea
- B – diarrhoea
- C – extreme restlessness
- D – memory loss

Drugs and the Brain

Basic

• Drugs that alter a person's emotions, behaviour or consciousness are called...

- A – placebo drugs
- B – psychoactive drugs
- C – physiological drugs
- D – psychosomatic drugs

• What type of drug is caffeine?

- A – a tranquilliser
- B – a depressant
- C – a hallucinogen
- D – a stimulant

• Which of the following is true of hallucinogens?

- A – they depress the nervous system
- B – they do not interfere with the brain's chemistry
- C – they make you feel, see, or hear things that don't really exist
- D – there are no associated withdrawal symptoms

- A – endorphin system
- B – limbic system
- C – endocrine system
- D – central nervous system

Advanced

• Dopamine, serotonin and noradrenaline are all...

- A – tranquillisers
- B – neurotransmitters
- C – psychoactive drugs
- D – hallucinogens

• Neurotransmitters are...

- A – chemical messengers that transfer signals across the gap between nerve cells
- B – psychoactive drugs that mimic or disrupt natural chemicals in our brains
- C – substances that speed up the passage of signals between nerve cells
- D – chemical messengers that reduce the body's production of endorphins

• Sleeping pills, solvents and alcohol are all...

- A – stimulants
- B – hallucinogens
- C – depressants
- D – endorphins

• How do depressants affect neurotransmitters?

- A – they block or reduce the amount of neurotransmitters
- B – they increase the amount of neurotransmitters
- C – they speed up the passage of signals between nerve cells
- D – they increase brain activity

• Answers

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