

## PISA Style Scientific Literacy Question

# Cannabis

### Cannabis - Text 1

Read the following information about the effects of cannabis on the body

*Cannabis is the most widely used illegal drug in Britain. Cannabis contains a chemical called THC which can alter the way your body works.*

*Cannabis can have a number of different effects on the body.*

- *It can make people feel chilled out, relaxed and happy*
- *It can make people feel hungry – giving them ‘the munchies’*
- *Cannabis can make people feel sleepy*
- *Users may experience heightening of the senses e.g colours are more vivid*
- *Users may experience hallucinations*
- *Users may experience anxiety and paranoia*
- *Cannabis increases the heart rate*
- *Cannabis use can affect co-ordination*
- *Cannabis use can lead to concentration problems*
- *Cannabis use can affect a persons motivation to do things*



### Question 1 : CANNABIS

From the information of its effects you have read in the text above, which part of the body do you think the cannabis drug has the biggest effect on ?

- A Brain
- B Heart
- C Kidneys
- D Lungs

continued

**Question 2 : CANNABIS**

Like alcohol, driving under the influence of drugs is illegal.

Circle 'yes' or 'no' for each of the following statements.

<b>The effect is likely to affect the ability to drive</b>	<b>Yes or No ?</b>
Cannabis can make people feel sleepy	Yes / No
Cannabis can affect co-ordination	Yes / No
It can make people feel hungry	Yes / No
Cannabis can lead to concentration problems	Yes / No

**Question 3 : CANNABIS**

Cannabis users may have difficulties with their studies in school, or at work.

Circle 'yes' or 'no' for each of the following statements.

<b>The effect is likely to affect a users school work or job</b>	<b>Yes or No ?</b>
Cannabis can make people feel sleepy	Yes / No
Cannabis can lead to concentration problems	Yes / No
It can make people feel hungry	Yes / No
Cannabis use can affect a persons motivation to do things	Yes / No

**Continued**

## Cannabis – Text 2

A study followed almost 2000 young people for 8 years to see if cannabis use increased their likelihood of developing mental health problems. The study organisers asked the young people to report whether they had experienced psychotic symptoms such as disturbed perceptions or paranoia. The following data was obtained during the last 5 years of the study.

	Percentage of people who reported psychotic symptoms.
Had taken cannabis at least 5 times	14%
Had not taken cannabis	8%

### Question 4 : CANNABIS

What does this data tell us about cannabis use and psychotic symptoms ?

- A Cannabis users are almost twice as likely to report psychotic symptoms as people who have not used cannabis
- B Cannabis users are half as likely to report psychotic symptoms as people who have not used cannabis
- C Cannabis users are no more likely to report psychotic symptoms than people who do not use cannabis
- D People who do not use cannabis do not report psychotic symptoms

### Question 5 : CANNABIS

A newspaper reported the data from this study under the headline '***Cannabis causes psychotic symptoms***'.

Give one piece of evidence from the table of data that supports the headline

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Give one piece of evidence from the table of data that does not support the headline

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## SCORING : CANNABIS

### Question 1

#### **Full credit :**

A Brain

#### **No Credit :**

Other responses

Missing

#### **Narrative:**

A - The text refers to a number of effects such as heightening of the senses, hallucinations, paranoia and anxiety, co-ordination, concentration and motivation. All of these effects will be caused by changes in the brain. Cannabis is known to over-activate receptors in the brain that influence memory, pleasure, sensory and time perception etc. After long term use, cannabis is thought to permanently reduce the number of connections in the areas of the brain which are responsible for thinking and memory. This effect seems to be greatest if the person starts using cannabis at a young age (during their teenage years).

B – The text refers to changes in heart rate, so there are effects on the heart, but the brain is responsible for how fast the heart beats.

C – There is no mention in the text of any effects of cannabis on the kidneys, so students should not choose this option from the list

D – There is no mention in the list of any effect on the lungs so this option should not be chosen. Smoking cannabis can affect the lungs in the same way that smoking cigarettes can (increased risk of respiratory infections and diseases) but this is not mentioned in the text.

Framework Categories	2015 Framework
Knowledge type	Knowledge of the content of science
Competency	Explain phenomena scientifically
Context	Hazards - personal
Cognitive demand	Low

### Question 2

#### **Full credit :**

Yes, Yes, No, Yes, in that order

#### **No credit :**

Other responses

Missing

**Narrative :**

Yes – cannabis makes people feel sleepy so it is not wise to drive as they may have impaired reactions and could fall asleep at the wheel and cause an accident.

Yes – driving requires a person to manipulate instruments such as the pedals, gear stick etc.. in a co-ordinated way. People who have taken cannabis will find it harder to co-ordinate these movements and so their ability to drive will be impaired.

No – being hungry is not likely to prevent a person from driving properly. Although students should recognise that hunger can lead to a drop in blood sugar, which can affect a person’s mood and energy levels. Some studies have linked hunger to increased feelings of anger or aggression.

Yes – if people are unable to concentrate on what they are doing they are likely to make errors or mistakes which could have dangerous consequences if a person is driving. They may not notice hazards that are around them e.g. other vehicles or pedestrians.

<b>Framework Categories</b>	<b>2015 Framework</b>
<b>Knowledge type</b>	Knowledge of the content of science
<b>Competency</b>	Explain phenomena scientifically
<b>Context</b>	Hazards - personal
<b>Cognitive demand</b>	Medium

**Question 3**

**Full credit :**

Yes, Yes, No, Yes, in that order

**No credit :**

Other responses

Missing

**Narrative:**

Yes – if a person is likely to fall asleep then they are not likely to be able to learn effectively in school. Tiredness may affect their ability and motivation to complete tasks. In some jobs, such as those which involve operating machinery, tiredness and even falling asleep could be very dangerous.

Yes – concentration problems could again be dangerous for some jobs. A lack of concentration is likely to impair a pupil’s performance in school if they are not giving their full attention to what the teacher is saying or the work they are doing.

No- hunger has been linked to aggression in some studies, and a lack of food can lead to a drop in blood sugar which will cause energy levels to drop, but actually feeling hungry should not stop someone from being able to do their school work or job to a significant extent.

Yes- cannabis has been shown to affect the area of the brain which affects motivation. Motivation is important for getting things done both at work and in school. Poorly motivated people are likely to perform less well and complete tasks to a lower standard. Studies have shown that cannabis users are more likely to arrive late or miss days from work or school.

Framework Categories	2015 Framework
Knowledge type	Knowledge of the content of science
Competency	Explain phenomena scientifically
Context	Hazards - personal
Cognitive demand	Medium

**Question 4**

**Full credit :**

A Cannabis users are almost twice as likely to report psychotic symptoms as people who don't use cannabis

**No credit :**

Other responses

Missing

**Narrative:**

A – this is the correct conclusion from the data presented. 14% of young people who had used cannabis reported psychotic symptoms compared to 8% who had not. 14% is almost double the figure of 8%.

B – this is not correct. As described in part A. The figure for cannabis users reporting psychotic symptoms is 14% which is almost double the figure of 8% for non cannabis users.

C – this is not correct. The figure for cannabis users is much higher than the figure for people who do not use cannabis. For this statement to be correct the figures would need to be almost similar.

D – You cannot say this from the data that is presented here. The data only shows how likely young people are to report psychotic symptoms. It does not give any evidence to prove that psychotic symptoms are caused by cannabis use.

Framework Categories	2015 Framework
Knowledge type	Epistemic
Competency	Interpret data and evidence scientifically
Context	Hazards – personal
Cognitive demand	Medium

### **Question 5**

#### ***Full credit :***

Supports the headline – a higher percentage of / more people who use cannabis report psychotic symptoms than those who don't use cannabis **or** a lower percentage of / less people who do not use cannabis report psychotic symptoms

Does not support the headline - 8% / some people who have not / never used cannabis have still reported / had psychotic symptoms. People who don't use cannabis still get / report psychotic symptoms. People can still experience psychotic symptoms even if they have never taken cannabis. Alternatively, the data is based on what people reported, not actually a clinical assessment / diagnosis. People may have reported symptoms they didn't have and vice versa. The data is only based on what people said so it can't be used to prove anything

#### ***Partial credit :***

Supports the headline – people who use cannabis have more psychotic symptoms or people who don't use cannabis have less psychotic symptoms (these statements are given only partial credit as for full credit students should refer to the number of people and not the amount of symptoms).

#### ***No credit :***

Other responses

Missing

#### ***Narrative :***

The newspaper headline is making a link between cannabis use and psychotic symptoms stating that cannabis use is directly causing these symptoms. This is not what is actually shown in the data. The data only shows the percentage of people who reported psychotic symptoms. These symptoms may not have been tested or diagnosed clinically, so may be subjective. The data only shows that young people who have taken cannabis are more likely to report psychotic symptoms than those who haven't. The fact that more cannabis users report these symptoms can be used to support the headline ( the question is not asking the student to prove the link). The data shows that people who haven't taken cannabis also sometimes experience psychotic symptoms (though not as often) so

this, along with the lack of clinical diagnosis, could be used to argue against the headline. If cannabis causes psychotic symptoms we may not expect non cannabis users to experience them as well.

<b>Framework Categories</b>	<b>2015 Framework</b>
<b>Knowledge type</b>	Epistemic
<b>Competency</b>	Interpret data and evidence scientifically
<b>Context</b>	Hazards - personal
<b>Cognitive demand</b>	High