

GCSE Biology B (Twenty First Century Science)
J257/04 Depth in biology (Higher Tier)

Question Set 10

1 Smoking cigarettes is linked to lung cancer.

(a) The National Health Service (NHS) in England helped 196 000 people who wanted to stop smoking in 2017.

(i) After using the NHS, 98 000 of these people told their doctor they had stopped smoking.

What percentage of the people who used the NHS said they had stopped smoking?

Percentage of people = % **[1]**

(ii) Doctors tested the breath of all the people who said they had stopped smoking.

The tests showed that 72% of these people really had stopped smoking.

How many people had successfully stopped smoking?

Number of people = people **[1]**

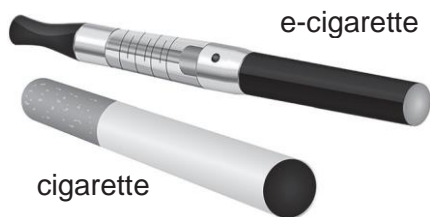
(b) Cigarette smoke contains carcinogens.

Carcinogens are substances that can cause mutations in a cell's DNA.

Explain how this can lead to cancer.

[3]

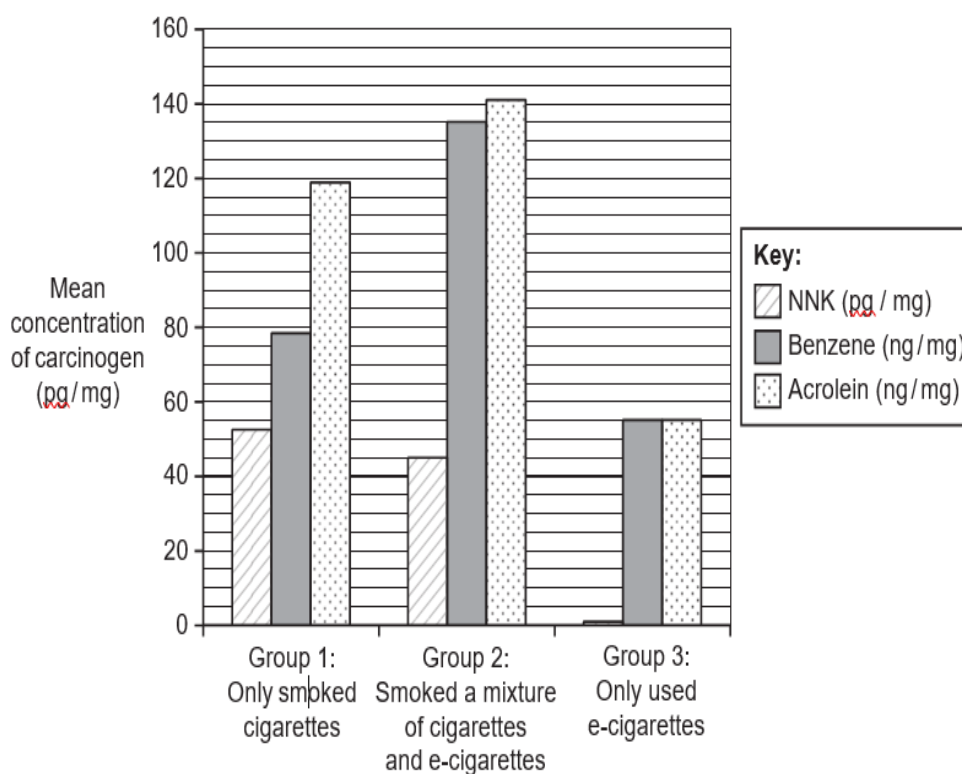
- (c) Some people who want to stop smoking cigarettes start using e-cigarettes (vaping) instead.



Cigarette smoke and e-cigarette vapour both contain carcinogens called NNK, benzene and acrolein.

Scientists measured the concentrations of these carcinogens in the saliva and urine of three groups of people. The groups had behaved in different ways for six months.

The results are shown in the bar chart.



- (i) The mean concentration of NNK for Group 1 was 53 pg/mg.
The mean concentration of NNK for Group 3 was 1 pg/mg.

Calculate the percentage change in the mean concentration of NNK in Group 3 compared to Group 1.

Percentage change = % [2]

- (ii) Read the news headline:

E-cigarettes 98% safer than cigarettes

Do you agree with the headline? Explain your answer.

[2]

- (iii)* Beth is worried because her mother and sister both died from lung cancer.

She plans to reduce the number of cigarettes she smokes and she will use an e-cigarette the rest of the time.

Describe the factors that affect Beth's risk of developing lung cancer **and** explain the best course of action for her.

[6]

Total Marks for Question Set 10: 15



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