

GCSE Science/Biology

Mark Scheme

GCSE Science/Biology
Internally Assessed Activity Unit B1b
Topic 4 - Use, Misuse and Abuse

Caffeine

1	a	i	espresso (coffee);	1	
		ii	600 (cm ³);	1	
	b	i	stimulant;	1	
		ii	decreases;	1	
	c		Chocolate has less caffeine in it; (So) nerve impulses will not be speeded up (so much)/it will help you sleep better; Or Caffeine has more caffeine in it; (So) nerve impulses will be speeded up more/it will keep you awake/not let you sleep well;	1 1	
					Total 6 marks

2	a	i	Allows an average to be taken/one person may react to caffeine abnormally or differently;	1	
		ii	Two from: Better control group; Less variables; Only difference is caffeine/other things in cola taken by both groups; Person won't know if they have caffeine/don't have caffeine;	2	
	b	i	Two from: Same age; same weight/height; same gender; same caffeine intake experience;	2	
		ii	May react to the thought of drink with caffeine/avoids placebo effect;	1	
	c	i	All 5 points plotted gains 2 marks 4 points plotted correctly gains 1 mark	2	
		ii	With caffeine line: Smooth curve showing trends (doesn't need to go through any points but must be within a tolerance of 3 mm of perfect line); Without caffeine line: Straight line between 71 and 73 beats per minute;	1 1	
		iii	Max of two marks for description and two marks for explanation up to a total of 3 marks Description Heart rate up as more cola or caffeine drunk; Rate increases as a curve/each successive amount affects to greater degree; Explanation Caffeine stimulates the heart rate; More caffeine has larger effect; Not long enough between drinks for body to remove caffeine;	3	
		iv	Description Stays (roughly) the same; Explanation No caffeine so heart rate unaffected;	1 1	
					Total 15 marks

3	a	<p>Two from: Caffeine taken in small amounts makes people more mentally alert; The effects of caffeine are not serious; To take high doses you must drink lots of drinks containing caffeine; People have been having drinks containing caffeine for many years without harm (idea of long time scale);</p>	2	
	b	<p>Four from may have to go through several stages (idea of a long time) of trialling or testing; drug may need further development and re-trialling or testing;</p> <p>explanation of testing on tissue (culture) e.g. labs need high tech expensive equipment or researcher;</p> <p>explanation of testing on animals e.g. have to be housed or fed; protection from protesters; may need to be tested on rats first and then primates;</p> <p>explanation of testing on human volunteers e.g. large numbers(>1000 required in tests to ensure no one has adverse effects; volunteers may need to be paid;</p>	4	
				Total 6 marks
				Overall total 27 marks