

Assessment Schedule – 2005

Human Biology: Describe maintenance of normal body functioning (90177)

Evidence Statement

Q	Achievement	Achievement with Merit	Achievement with Excellence
1(a)	<p>Descriptions of the functions of named hormones in relation to normal body functioning.</p> <p>THREE out of FIVE responses correct.</p> <ul style="list-style-type: none"> • (ADH) controls the level of water / water balance in the body. • (GH) controls the [rate of] growth of the body / growth of bones. • (Thyroxine) controls the metabolic rate of the body. • (Insulin) controls the level of glucose in the body. • (Adrenalin) prepares the body for an emergency. 		
1(b)	<p>Description of how feedback maintains thyroxine levels.</p> <p>Response needs to refer to both thyroxine and TSH.</p> <ul style="list-style-type: none"> • The amount / level of thyroxine in the blood feeds back information to the pituitary. • The amount / level of TSH in the blood feeds back information to the thyroid. 	<p>Description and linked explanation of how feedback maintains thyroxine levels. Response needs to refer to both thyroxine and TSH.</p> <ul style="list-style-type: none"> • High level of TSH makes / causes the thyroid to release thyroxine [or vice versa]. <p>OR</p> <ul style="list-style-type: none"> • Low level of thyroxine makes the pituitary gland release TSH [or vice versa]. 	
1(c)	<p>Description of how iodine shortage changes the feedback system.</p> <ul style="list-style-type: none"> • Lack of iodine means that thyroid gland cannot make enough thyroxine. 	<p>Identifies that the thyroid gland cannot make enough thyroxine, linked to the effect of the feedback system with reduced thyroxine.</p> <p>Any TWO of:</p> <ul style="list-style-type: none"> • Low levels of thyroxine stimulate the pituitary to produce TSH. • TSH stimulates the thyroid gland. • No feedback to the pituitary to stop making TSH. 	<p>TWO ideas linked from Merit, plus any TWO ideas of iodine shortage</p> <p>OR THREE ideas linked from Merit plus any one idea of iodine shortage.</p> <p>Eg</p> <ul style="list-style-type: none"> • System cannot maintain its balance. • Lack / low levels of thyroxine means that the metabolic rate [BMR] drops and can't be raised. • Hypothyroidism / underactive thyroid. • Enlargement of thyroid gland causing goitre.

Q	Achievement	Achievement with Merit	Achievement with Excellence
2(a)	<p>Definition or description of the process of homeostasis.</p> <ul style="list-style-type: none"> • (Homeostasis is the ability of the body) to maintain a stable / constant internal environment [despite a changing external environment]. 		
2(b)	<p>Description of ONE cause of lower temperature in the hands and feet.</p> <ul style="list-style-type: none"> • Heat is lost from the blood as it is transported to the hands and feet. • Hands and feet are a long way from the body core / heat sources. • Hands and feet exposed / in contact with colder surfaces. 	<p>Description and linked explanation of the cause of lower temperature in the hand and feet.</p> <p>Heat leaves the blood vessels / arterioles of the arms and legs. As it is a long distance to the hands and feet, this heat loss can significantly lower the temperature of these two.</p> <p>Blood vessels cannot be buried deep in the hands or feet.</p> <p>Large surface area exposed leading to loss / radiation of heat.</p>	
2(c)	<p>Description of how a cold body returns to normal temperature.</p> <p>TWO responses correct:</p> <ul style="list-style-type: none"> • blood kept from surface vessels [arterioles] / surface vessels contract • shivering • hair raised / goose bumps • increase in metabolic rate [BMR]. 	<p>Description and linked explanation of how a cold body returns to normal temperature.</p> <p>TWO responses correct</p> <ul style="list-style-type: none"> • Heat is no longer lost from the blood as it passes near the surface of the body. • Shivering releases heat energy [from the muscles]. • Raising the hair in mammals traps air to insulate [no longer applicable to humans]. • Increase in the BMR releases heat energy. 	
<p>Answers should not include behavioural responses such as putting on clothes etc.</p> <p>Note: sweating not acceptable as a cold body would not sweat.</p>			
3(a)	<p>Description of the body's response to a sudden intake of sugar.</p> <p>ONE idea of:</p> <ul style="list-style-type: none"> • Rapid increase in blood sugar / glucose levels occurs stimulating the production of insulin [by the pancreas]. • Excess sugar / glucose is converted to glycogen for storage. 		

Q	Achievement	Achievement with Merit	Achievement with Excellence
3(b)	<p>Description of the short-term effects of caffeine on the body.</p> <p>Any TWO correct responses.</p> <ul style="list-style-type: none"> • Caffeine stimulates the body / CNS / heart / respiratory system • Alertness / concentration / energy increases • Increased nervousness / irritability / restlessness / “on edge” • Possible panic attacks • Increase in urine production • Stimulates acid production in the stomach. 		
3(c)	<p>Description of the likely effects of candidate’s choice of drink on an athlete. Response needs to reflect / support choice of drink as candidate required to make a choice of water or energy,</p> <p>Eg</p> <p>EITHER of</p> <ul style="list-style-type: none"> • Sugar and / or caffeine may have dehydrating effect (supports water). <p>OR</p> <ul style="list-style-type: none"> • Drinking water will replace that lost in sweat (supports water). <p>AND</p> <ul style="list-style-type: none"> • Sugar and / or caffeine may boost energy levels (supports energy drink). 	<p>Response needs to explain how each drink affects body functions. Must be response for water and energy drink, with support for ONE.</p> <p>Eg</p> <ul style="list-style-type: none"> • High sugar level means that water is absorbed more slowly into the body (supports water). <p>OR</p> <ul style="list-style-type: none"> • Caffeine is a mild diuretic so urine production is increased (supports water). <p>OR</p> <ul style="list-style-type: none"> • Water will reduce dehydration from sweating during exercise (support for water). <p>AND</p> <ul style="list-style-type: none"> • Sugar is needed for energy for the muscles; caffeine can promote the levels of glycogen for energy (supports energy drink). 	<p>Comparison is important here. Responses need to clearly indicate why energy drinks are not preferable to water during training.</p> <p>As for Merit but linked to any TWO of:</p> <ul style="list-style-type: none"> • Energy drinks are not suitable for athletes as the energy content is in excess of their needs [unless needed for endurance training]. • Risk of dehydration as caffeine is a diuretic and sugar levels are high enough to promote thirst not quench it. • Max of TWO cans of energy drinks a day is the safety limit; this is only 500 mL fluid; more is needed to overcome fluid loss from training. • Water will overcome the problem of dehydration without the added [not required] sugar and caffeine. • Risk of caffeine addiction over time [plus the short term effects given in 3(b)].

Judgement Statement

Achievement

Total of FIVE opportunities answered at Achievement or higher.

5 × A

Achievement with Merit

Total of SIX opportunities answered with a minimum of THREE at Merit level or higher.

6 × A with minimum of 3 at M.

Achievement with Excellence

A total of SEVEN opportunities answered with THREE at Merit level and or higher and at least ONE at Excellence.

3 × A, with 3 at M and 1 at E