

Assessment Schedule – 2018

Biology: Demonstrate understanding of biological ideas relating to a mammal(s) as a consumer(s) (90929)

Evidence Statement

Q	Achievement	Merit	Excellence
ONE	<p>Examples of possible ideas include:</p> <ul style="list-style-type: none"> Enzymes are involved in the process of (chemical) digestion of food / speed up digestion. Lipase digests / breaks down fats. Protease digests proteins. Amylase digests starch / carbohydrate. Chemical digestion begins in the mouth. Pepsin works in the low pH / acidic conditions. Protein digestion occurs in the stomach (in omnivores / carnivores). Amylase works in neutral pH. Cellulase digests plant material / cellulose. No digestive enzymes in the saliva of carnivores. Enzymes have an optimal pH. Enzymes have a specific shape OR implies Lock and key. TWO of: Herbivores eat plant material / carbohydrates: Carnivores eat meat / protein: Omnivores eat both plant / carbohydrates and meat / protein. 	<p>Examples of possible explanations include:</p> <ul style="list-style-type: none"> Enzymes carry out digestion in order for large particles / molecules to be broken down into small (soluble) ones that can be absorbed. Enzymes are pH specific so different parts of the body have different pH e.g. mouth has a pH of approx. 7 and stomach has a pH of about 2. If enzymes are outside this pH the enzyme denatures / changes shape / stops working. Herbivores eat mainly plant material / cellulose / carbohydrates which is digested by amylase in the mouth & / OR bacteria in the stomach / cecum. Carnivores eat meat / protein which is digested by protease / pepsin / trypsin in the stomach and SI. Omnivores eat both carbohydrates / plants / cellulose and protein / meat which is digested by different enzymes eg carbohydrates digested by amylase, protein digested by proteases / trypsin etc. Enzymes have a specific shaped active site therefore only pepsin can break down protein and amylase can break down carbohydrates etc. 	<p>Examples of possible discussions include:</p> <ul style="list-style-type: none"> There are differences in the type and position of enzymes in the gut of a mammal according to the type of diet it eats. Herbivores eat mainly plant material, which is made up of cellulose / carbohydrates. Due to this, herbivores secrete amylase in their saliva in the mouth and SI & / OR have bacteria in their stomachs / cecum to digest the cellulose but do not have proteases as they do not eat meat / protein. Carnivores eat mainly meat which is high in protein. Due to this they have pepsin / protease in their stomach / SI but do not really have amylase as they do not need to digest much carbohydrate. Omnivores eat both plant and animal material and due to this they secrete enzymes that digest both carbohydrates and protein e.g. (at least 2 needed) amylase in the mouth / SI breaks down the carbohydrates and pepsin / protease in the stomach and SI breaks down protein and lipase breaks down fats in the SI.

NØ	N1	N2	A3	A4	M5	M6	E7	E8
No response / no relevant evidence.	ONE relevant idea given.	TWO relevant ideas given.	THREE relevant ideas given.	FOUR relevant ideas given.	Explains TWO relevant ideas.	Explains THREE relevant ideas.	Links differences in enzyme location and type to TWO types of consumer. OR ONE consumer type-what it has and why it doesn't have another specific enzyme	Links differences in enzyme position or type to all types of consumer (herbivore, carnivore and omnivore).

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TWO	<p>Examples of possible ideas include:</p> <ul style="list-style-type: none"> • Villi increase the surface area for absorption of digested food. • Villi have blood vessels for absorption of glucose and amino acids. • Villi have lacteals for the absorption of fatty acids and glycerol / products of fat. • Microvilli increase the surface area of the villi. • Villi are found on the walls of the small intestine. • Villi are not found on the wall of the colon / stomach. • Villi are only one cell thick / thin. • Absorption is the movement of small molecules into the blood stream. • Assimilation is the uptake of nutrients by cells. 	<p>Examples of possible explanations include:</p> <ul style="list-style-type: none"> • Villi are specialised for absorption in the small intestine. They are thin walled / one cell thick which results in a short diffusion distance into the bloodstream. • Villi are folded to increase the surface area available for absorption so that glucose & / OR amino acids can move efficiently into the blood stream / capillaries. • Microvilli are found on the wall of the villi. These also increase the surface area available for absorption. • Different parts of the intestines have different amounts of villi depending on what molecules are absorbed eg SI have large amounts as they absorb digested molecules OR LI are smooth / have fewer villi as they absorb water / do not absorb digested molecules. 	<p>Examples of possible discussions include:</p> <ul style="list-style-type: none"> • Villi are specialised for absorption in the small intestine. They are thin walled / one cell thick, (with a rich blood supply) resulting in a short diffusion distance into the blood. They are also folded to increase the surface area; both these factors increase efficiency so that the digested proteins & / OR digested carbohydrates can diffuse into the blood stream. • Different parts of the intestines have different amounts of villi depending on what molecules are absorbed eg SI have large amounts as they absorb digested molecules into the blood stream AND LI are smooth / have fewer villi as they absorb water into the blood stream / do not absorb digested molecules.

NØ	N1	N2	A3	A4	M5	M6	E7	E8
No response / no relevant evidence.	ONE relevant idea given.	TWO relevant ideas given.	THREE relevant ideas given.	FOUR relevant ideas given.	Explains TWO relevant ideas.	Explains THREE relevant ideas.	Links ONE explanation to increased efficiency of absorption due to villi. OR Links presence or absence of villi in different parts of the gut to function.	Links ONE explanation to increased efficiency of absorption due to villi AND Links presence or absence of villi in different parts of the gut to function.

Q	Achievement	Merit	Excellence
THREE	<p>Examples of possible ideas include:</p> <ul style="list-style-type: none"> • Products of digestion include glucose / amino acids / fatty acids and glycerol. • Glucose is used in the process of respiration OR word equation OR symbol equation. • Blood vessels in the SI wall absorb the digested food materials. • Digested food molecules are transported in the blood around the body. • Some places in the body require more energy OR do more respiration OR need more glucose. • Muscle cells require more energy OR fat cells require less etc. • The circulatory system is made up of a series of arteries and veins that transport blood (around the body, pumped by the heart). • Respiration is the process whereby energy is released through the breakdown of glucose. 	<p>Examples of possible explanations include:</p> <ul style="list-style-type: none"> • Some places in the body require more energy to function. For example, muscle cells involved in movement require more energy than eye cells. • Higher energy cells e.g. muscle cells absorb more glucose from the blood than eye cells, (so that more energy can be released). • The circulatory system is made up of a series of arteries and veins that transport blood around the body, pumped by the heart. • Digested food is absorbed into the SI wall and transported to places / cells they are needed. For example, glucose is transported to body cells for respiration to release energy OR amino acids are transported to cells for making protein OR fatty acids and glycerol are transported to cells for energy store. 	<p>Examples of possible discussions include:</p> <ul style="list-style-type: none"> • Digested nutrients are absorbed into the blood stream surrounding the small intestine and transported to the cells for respiration and energy production. Some cells have a higher-level energy requirement eg muscle cells, therefore need more glucose to produce this energy, while eyes need less energy therefore do not need as much glucose. • Respiration is a chemical process that occurs in body cells to release energy from glucose, (a product of digestion). Cells that require more energy eg muscle cells have a rich blood supply so they get enough glucose for respiration, while skin cells need less energy therefore do not need as much blood providing glucose to them.

NØ	N1	N2	A3	A4	M5	M6	E7	E8
No response / no relevant evidence.	ONE relevant idea given.	TWO relevant ideas given.	THREE relevant ideas given.	FOUR relevant ideas given.	Explains TWO relevant ideas.	Explains at least THREE relevant ideas.	Discussion links at least ONE explanation. Eg why some cells require more glucose than others OR How blood supply in different parts affects glucose delivery	Discussion links TWO explanations. Eg why some cells require more glucose than others AND How blood supply in different parts affects glucose delivery

Cut Scores

Not Achieved	Achievement	Achievement with Merit	Achievement with Excellence
0 – 6	7 – 12	13 – 18	19 – 24