

Assessment Schedule – 2015

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

Evidence Statement

ONE	NØ	N1	N2	A3	A4	M5	M6	E7	E8
	No response / no relevant evidence.	ONE idea given.	TWO ideas given.	THREE ideas given.	FOUR ideas given.	Explains how the structures of TWO teeth types are suited to the diet of a cat OR a sheep. <u>Carnivore / Cat</u>	Explains how the structures of TWO teeth types of BOTH the cat and the sheep, lacking in making comparisons. <u>Carnivore / Cat</u>	Compares the structures of the teeth of BOTH the cat and the sheep and links to diet. • Cat / Carnivores eat meat, which is why they have sharp canines made to puncture, rip, and tear large pieces of meat, which are minimised or non-existent in most herbivores, because they eat tough cellulose and fibrous material. • The herbivore has large molars with an increased surface area to grind plant material up and break down the tough cell wall, compared to carnivores, whose molars are much smaller but significantly sharper to aid in tearing, grinding meat into smaller molecules. • Cat / Carnivore jaws move only up and down in crushing and cutting motions to deal with the meat, as opposed to laterally	Compares the structures of the teeth of BOTH the cat and the sheep and links to diet.
	<ul style="list-style-type: none"> • <i>Digestion is the breakdown of large insoluble materials into smaller soluble ones</i> (that will pass through the villi in the small intestine into the blood stream.) • Physical digestion uses the teeth. • Three types of teeth named – incisors, canines, premolars, and molars. (Need THREE correct.) 					<ul style="list-style-type: none"> • Canines, long sharp to kill prey and tear meat • Pointed incisors to scrape meat off bones / cut the food into smaller pieces • Sharp, jagged, blade-like molars so can cut through meat and bone. 	<ul style="list-style-type: none"> • Canines, long sharp to kill prey and tear meat • Pointed incisors to scrape meat off bones / cut the food into smaller pieces • Sharp, jagged, blade-like molars so can cut through meat and bone. 		
	<u>Carnivore / Cat</u> <ul style="list-style-type: none"> • Canines sharp and pointed. • Sharp pointed incisors. • Sharp / jagged molars. • No diastema. <p>Need 2 of</p>		<u>Herbivore/ Sheep</u> <ul style="list-style-type: none"> • Molars and/ or premolars have a flat large surface area. • Incisors are sharp / flat edged / ridged • Molars have raised ridges / cusps. • Reduced canines / no canines at all • Large diastema <p>Need 2 of</p>		<u>Herbivore/ Sheep</u> <ul style="list-style-type: none"> • flattened / wide molars / large molars (to increase the surface area) which is where the crushing and grinding of food occur. / The ridges/ cusps also enable the food to be ground up more finely. • broad, flat incisors for cutting plant material <p>OR</p> <p>How the structures of the jaw are suited to the diet of a cat or a sheep.</p> <u>Carnivore / Cat</u> <ul style="list-style-type: none"> • have no diastema 	<u>Herbivore/ Sheep</u> <ul style="list-style-type: none"> • flattened / wide molars / large molars (to increase the surface area) which is where the crushing and grinding of food occur. / The ridges/ cusps also enable the food to be ground up more finely. • broad, flat incisors for cutting plant material <p>OR</p> <p>How the structures of the jaw are suited to the diet of a cat or a sheep.</p> <u>Carnivore / Cat</u> <ul style="list-style-type: none"> • have no diastema because food does not 			

			<p>because food does not need to be chewed as much</p> <ul style="list-style-type: none"> • jaws move only up and down in cutting motions to chop the food like scissors <p><u>Herbivore/ Sheep</u></p> <ul style="list-style-type: none"> • Have diastema because food in the mouth needs to be chewed as much as possible. • Laterally (side to side), which is needed for chewing and grinding plant material. 	<p>need to be chewed as much</p> <ul style="list-style-type: none"> • jaws move only up and down in cutting motions to chop the food like scissors <p><u>Herbivore/ Sheep</u></p> <ul style="list-style-type: none"> • Have diastema because food in the mouth needs to be chewed as much as possible. • Laterally (side to side), which is needed for chewing and grinding plant material. 	<p>(side to side), which is needed for chewing and grinding tough cellulose plant matter.</p> <p>OR</p> <p>Discusses the role and sequence of both enzymes in the digestive process.</p>	
c	<ul style="list-style-type: none"> • Chemical digestion is the process in which enzymes in the body breakdown large food molecules into smaller ones (so that they can pass into the bloodstream through the wall of the intestine). • Salivary amylase is produced by the salivary glands / mouth. • Salivary amylase breaks down starch into glucose in the mouth. • Pepsinogen / pepsin is released by (chief) cells in the stomach lining. • Pepsin breaks down proteins into polypeptides in the stomach. 	<p>OR</p> <p>How the pH affects the rate of chemical digestion in the mouth OR stomach.</p> <ul style="list-style-type: none"> • The pH of the mouth is about 7, which is the optimal pH for salivary amylase to work as it has the highest rate of carbohydrate breakdown into glucose. • the pH of the stomach is about 2, which is the optimal pH for pepsin to work as it has the highest rate of protein breakdown into polypeptides/ amino acids. 	<p>AND</p> <p>How the pH affects the rate of chemical digestion in the mouth and stomach.</p>	<p>OR</p> <p>Discusses the role and sequence of both enzymes in the digestive process.</p> <ul style="list-style-type: none"> • Enzymes work most efficiently in optimum pH conditions. For example, amylase works best in a neutral pH environment (mouth 6.5–7.5) to break down carbohydrates into glucose and the stomach is acidic (pH 2) to breakdown proteins into polypeptides. Different parts of the digestive system have different pH's. If the pH is either too basic 	<p>AND</p> <p>Discusses the role and sequence of both enzymes in the digestive process.</p>	

				<p>or too acidic for the enzyme it will no longer work (denature) and will not be able to carry out its function in digesting that food type therefore the rate of reaction will decrease. AND</p> <ul style="list-style-type: none">• So when you swallow your food the amylase will be denatured when it moves into the acidic stomach.	
--	--	--	--	--	--

TWO	N0	N1	N2	A3	A4	M5	M6	E7	E8
	No response/ no relevant evidence.	ONE idea given.	TWO ideas given.	THREE ideas given.	FOUR ideas given.	Explains how ONE named organs in the cat OR sheep assist in the digestion of their food.	Explains how TWO named organs in the cat AND sheep assist in the digestion of their food. TWO explanations required (no comparison).	TWO links/ comparison Links explanations to discuss how named organs in the cat AND sheep assist in the digestion of their food. Linked to type of food that is being digested.	THREE or more links / comparison Links explanations to discuss how named organs in the cat AND sheep assist in the digestion of their food. Linked to type of food that is being digested.
	<p>Similarities of digestive systems</p> <ul style="list-style-type: none"> • Both have acidic environment in the stomach. • Both use enzymes to catalyse the breakdown of large organic molecules. • Both use muscular contractions like peristalsis to move the digested material around the body. • Both have the same organs (mouth, stomach, small intestines, large intestines, rectum, anus) <p>Differences</p> <p><u>Cat / Carnivore</u></p> <ul style="list-style-type: none"> • Shorter / wider small intestine. • Caecum of reduced size and importance. • Shorter large intestine. • Does not use a lot of chewing to break up meat – more the tearing and ripping. • Rapid movement of ingested food through system. <p><u>Sheep / Herbivore</u></p> <ul style="list-style-type: none"> • Has many stomachs (4). • Has a large caecum. • Small intestines are very long / thin. • Ingests food with high cellulose content. • Uses a lot of chewing (mastication) – physical digestion to break up tough plant material. • Ingested food takes longer to move through system. 					<p>Explains that the small intestine is longer in herbivores / sheep, which provides more time for the breakdown of cellulose.</p> <ul style="list-style-type: none"> • The small intestines of carnivores / cat are usually shorter because meat is easier to digested by enzymes. • In the herbivores/ sheep the caecum is greatly enlarged (and serves as a storage organ) so that the bacteria have time to digest the plant material/ cellulose. • Rumen / first stomach of sheep contain bacteria which digest / breaks down (tough) cellulose. 	<p>Explains that the small intestine is longer in herbivores / sheep, which provides more time for the breakdown of cellulose.</p> <ul style="list-style-type: none"> • The small intestines of carnivores / cat are usually shorter because meat is easier to digested by enzymes. • In the herbivores/ sheep the caecum is greatly enlarged (and serves as a storage organ) so that the bacteria have time to digest the plant material/ cellulose. • Rumen / first stomach of sheep contain bacteria which digest / breaks down (tough) cellulose. 	<p>Links explanations to discuss how named organs in the cat AND sheep assist in the digestion of their food. Linked to type of food that is being digested.</p> <ul style="list-style-type: none"> • An explanation that sheep are herbivores and eat a high content of plant material, which has a high content of cellulose, and therefore requires a longer time to digest and a longer digestive tract while cats are carnivores and require a shorter digestive tract, due to rapid digestion due to more rapid digestion of the more easily digested meat. • Since sheep don't make the enzymes to digest cellulose, they need a rumen AND / OR caecum to house the microorganisms which digest / ferment the cellulose for them while cats do not eat cellulose they do not need to store 	<p>Links explanations to discuss how named organs in the cat AND sheep assist in the digestion of their food. Linked to type of food that is being digested.</p> <ul style="list-style-type: none"> • An explanation that sheep are herbivores and eat a high content of plant material, which has a high content of cellulose, and therefore requires a longer time to digest and a longer digestive tract while cats are carnivores and require a shorter digestive tract, due to rapid digestion due to more rapid digestion of the more easily digested meat. • Since sheep don't make the enzymes to digest cellulose, they need a rumen AND / OR caecum to house the microorganisms which digest / ferment the cellulose for them while cats do not eat cellulose

				<p>microorganisms for cellulose digestion therefore do not have a large caecum.</p> <ul style="list-style-type: none"> • In sheep have more than one stomach because the food they eat needs to be processed multiple times / more than once so that the bacteria can ferment /release important nutrients from the cellulose material while cats only need one stomach because they consume more easily digested protein /meat which.cn be broken down by pepsin / enzymes alone. 	<p>they do not need to store microorganisms for cellulose digestion therefore do not have a large caecum.</p> <ul style="list-style-type: none"> • In sheep have more than one stomach because the food they eat needs to be processed multiple times / more than once so that the bacteria can ferment/ release important nutrients from the cellulose material while cats only need one stomach because they consume more easily digested protein /meat which.cn be broken down by pepsin / enzymes alone.
--	--	--	--	---	---

THREE	NØ	N1	N2	A3	A4	M5	M6	E7	E8
(a)	No response / no relevant evidence.	ONE idea given.	TWO ideas given.	THREE ideas given.	FOUR ideas given.	TWO explanation required	A total of FOUR explanation required from (a) and (b) sections	ONE linked explanations. Product named, how it is transported and what it is used for in other regions of the body	TWO linked explanations. Products named, how they are transported and what they are used for in other regions of the body
	<ul style="list-style-type: none"> Lipase breaks down lipids into fatty acids and glycerol Trypsin/ proteases breaks down protein/ polypeptides into amino acids Amylase / maltase breaks down starch into glucose Bile is made in the liver, stored in the gall bladder, and is secreted into the duodenum, which breaks up fat globules to tiny fat droplets. Pancreatic juice is secreted by the pancreas, containing enzymes which digest fats, starch, and proteins. 					<ul style="list-style-type: none"> Bile emulsifies the fat globules into tiny droplets as (it contains salts), which disperse the fat globule into many fat droplets – this increases the surface area of the fat, which speeds up the action of the enzyme lipase. Pancreatic juice is secreted by the pancreas, containing enzymes which digest fats, starch, and proteins such as lipase breaks down lipids into fatty acids and glycerol, trypsin/ proteases breaks down protein/ polypeptides into amino acids, amylase / maltase breaks down starch into glucose <p>AT LEAST TWO enzymes named and explained.</p>			
(b)	<ul style="list-style-type: none"> Villi / Microvilli increase the surface area of the small intestine. Each villus is lined with a lacteal surrounded by a network of capillaries. The network of capillaries joins to the hepatic portal vein where the digested products are taken to the liver. Villi are thin walled and capillaries are found close to the surface, allowing rapid absorption. Glucose/ amino acids absorbed into blood stream/ capillaries. Fatty acids and glycerol absorbed into lymphatic system. Amino acids used for making proteins/ growth and repair. Fatty acids and glycerol used for ATP synthesis/ energy store. Glucose used for respiration. 					<ul style="list-style-type: none"> The villi provide a large surface area where the soluble molecules/ glucose / amino acids are transported through the lining of the villi microvilli into the blood (via the hepatic portal vein), where it is taken to the liver. The villi provide a large surface area where the insoluble molecules / fatty acids and glycerol are transported through the lining of the villi / microvilli into the lymphatic system. From the villi, glucose is transported by the blood to the cells where it is used for respiration OR stored in the liver as glycogen. From the villi, amino acids are transported by the blood to the cells where they are used to make proteins. From the villi, fatty acids and glycerol are transported by the lymphatic system to the cells where they are used for ATP synthesis and / or energy storage. 		<ul style="list-style-type: none"> The soluble molecules/ glucose / amino acids are transported through the lining of the villi / microvilli into the blood (via the hepatic portal vein), where it is taken to the liver, then transported to the cells where it is used for respiration / stored in the liver as glycogen OR from the villi, <u>amino acids</u> are transported by the blood to the cells where they are used to make proteins. The insoluble molecules / fatty acids and glycerol are transported through the lining of the villi / microvilli into the lacteal/ lymphatic system. From here the fatty acids and glycerol are transported by the lymphatic system to the cells where they are used for ATP synthesis and / or energy storage. 	

Cut Scores

Not Achieved	Achievement	Achievement with Merit	Achievement with Excellence
0 – 7	8 – 13	14 – 18	19 – 24