

Assessment Schedule – 2019**Biology: Demonstrate understanding of biological ideas relating to a mammal(s) as a consumer(s) (90929)****Evidence Statement**

Q	Achievement	Merit	Excellence
ONE	<p>Describes (single, simple ideas):</p> <ul style="list-style-type: none"> • structure of different types of teeth • function of different types of teeth • what teeth do in digestion (generally) • the process of digestion • the purpose of digestion • what carnivores eat • what omnivores eat • what herbivores eat. <p>Some examples of possible descriptions include:</p> <ul style="list-style-type: none"> • Teeth are part of the process of mechanical digestion. • Teeth have a strong coating of enamel which enable the tooth to be sharp. • Teeth help to break down food from large pieces to smaller pieces. • Mechanical / physical digestion is the process of breaking food down from larger pieces / molecules to smaller pieces / molecules. • Carnivores eat mainly meat. • Herbivores eat mainly plant material. • Omnivores eat both plant material and other animals (meat). • Incisors are the teeth that are used to bite food. • Canines are sharp / pointed teeth, used for ripping and tearing food apart • Canine used to pierce and kill prey. • Premolars / molars are used for chewing and grinding food. • Herbivores have diastema. 	<p>Explains (gives reasons and examples):</p> <ul style="list-style-type: none"> • why teeth are important to the process of digestion • how / why teeth differ according to diet. <p>Teeth differ according to the main diet eaten by the mammal. This is because the teeth are designed to be most efficient at breaking down different types of food</p> <p>Examples of possible explanations include:</p> <ul style="list-style-type: none"> • Teeth are an important part of the overall process of digestion because they break food down from larger pieces to smaller pieces through a process called mechanical digestion, this makes food easier to swallow (prevents choking). • This is important because as well as allowing the mammal to have access to food through biting (the job of the incisors), the breaking down from larger pieces to smaller pieces increases the surface area available for enzymes to act on. This increases the efficiency of the start of the process of chemical digestion. • Herbivore, e.g. a horse, eats plant-based material, which needs to be first of all cut or torn from the plant, e.g. grass. The herbivore incisors are able to do this because they are sharp. The plant material then needs to be ground down into small pieces to release as much of the nutrients as possible. • The molar teeth are flat with an increased surface area and ridges across the surface, which increase their ability to grind the plant material. • Herbivores have diastema so that there is side to side motion to allow molars to rub against each other in order to breakdown plant / cellulose. 	<p>Compares and contrasts</p> <ul style="list-style-type: none"> • The structure / function of carnivore, omnivore, herbivore teeth in digestion. <p>Teeth differ according to the main diet eaten by the mammal. This is because the teeth are designed to be most efficient at breaking down different types of food.</p> <p>Examples of possible discussions include:</p> <ul style="list-style-type: none"> • A herbivore, e.g. a horse, eats plant-based material which needs to be first of all cut from the plant, e.g. grass. The herbivore incisors are able to do this because they are sharp. The plant material then needs to be ground down into small pieces to release as much of the nutrients as possible. The molar teeth are flat with an increased surface area and ridges across the surface, which increase their ability to grind the plant material. • On the other hand, carnivores, e.g. a cat, eat mainly meat (or other animals). In order to do this, the carnivore usually needs to catch and hold on to the food (prey) first, before it can kill and eat it. In order to do this, carnivores usually have sharp teeth towards the front or sides of the mouth that can grasp and hold onto moving prey. These teeth are the incisors and the canines. The incisors are sharp and the canines are sharp and pointed as well, which is useful for both holding on to and cutting flesh. Some carnivores, e.g. dogs, also have carnassial teeth, which are modified molars, which are adapted to allow for the shearing (rather than tearing) of flesh to permit the more efficient consumption of meat (swallows meat quickly). • Omnivores eat both plants and animals (meat). In order to do this, they have a combination of both sets of teeth from herbivores and carnivores. They have sharp incisors at the front to cut plant-based food and hold / cut flesh. The molar teeth are flat with an increased surface area and ridges across the surface, which increase their ability to grind the plant material. As these mammals consume both plants and

		<ul style="list-style-type: none"> • Carnivores have incisors that are sharp, and the canines are sharp and pointed as well, which is useful for both holding on to and cutting flesh. • Carnivores have smaller molars because they don't chew their food as long, because it is not cellulose / plant-based (mentions idea of up and down movement). • Canines in carnivores are pointy and sharp in order to pierce vital organs to kill prey, which makes it easier to eat them. • Omnivores have a mixture of teeth from both carnivores and herbivores as their diet consists of both plant and animals. 	animal products, they need to utilise sharp canine for holding and cutting flesh as well as molars to grinding plant material.
--	--	--	--

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 idea.	Explains THREE relevant ideas.	Compares and contrasts two of herbivore, carnivore, and omnivore.	Compares and contrasts teeth of herbivore, carnivore, and omnivore.

Q	Achievement	Merit	Excellence
TW O	<p>Describes (single, simple ideas):</p> <ul style="list-style-type: none"> the function of parts of the digestive system the importance of each part of the alimentary canal to the process of food digestion. <p>Examples of possible descriptions include:</p> <ul style="list-style-type: none"> Digestion begins in the mouth through the action of teeth chewing food. The tongue helps mix food with saliva in the mouth. The oesophagus connects the mouth to the stomach. The stomach is where food is stored / churned and protein digestion occurs. Protease enzymes are released into the stomach to digest proteins. Food is moved through the alimentary canal by peristalsis. The gall bladder releases bile into the partially digested food. Bile helps to digest fats / neutralise stomach acid The first part of the small intestine is where bile is added with lipases to digest fats. Other enzymes (trypsin, amylase) are also released in the small intestine to digest proteins, sugars. Gives an example of how the liver is involved (produces bile etc) The pancreas releases enzymes and sodium bicarb to neutralise stomach acid. The rest of the small intestine is involved in the absorption of the products of digestion, e.g. fatty acids, glycerol, amino acids, glucose. The large intestine absorbs excess water from remains of the food. Villi are out-foldings of the small intestine wall Waste is expelled through the anus/ rectum stores waste. 	<p>Explains (gives reasons and examples):</p> <ul style="list-style-type: none"> how the parts of the digestive system work why / how the function of each part is important in digestion. <p>Examples of possible explanations include:</p> <ul style="list-style-type: none"> Digestion begins in the mouth through the action of teeth chewing food, this breaks down large pieces into smaller pieces, which increases surface area for chemical digestion (also helps with swallowing food). In the mouth saliva is added which makes the food moist and easier to swallow Amylase added in mouth to start breakdown of starch into smaller molecules (e.g. maltose). The stomach is where food is stored and protein digestion occurs. Proteins need to be broken down into their smaller parts called amino acids. This is important because proteins themselves are too big to be absorbed through the villi on intestine walls, whereas amino acids are much smaller / acidic environment assists in digestion of food and increases surface area. Enzymes are produced throughout the digestive tract to help breakdown large molecules into small molecules. Different enzymes breakdown different molecules, e.g. Protease enzymes are released into the stomach to digest proteins. The liver produces bile, which is stored in the gall bladder and acts upon fat molecules to emulsify fats increasing their surface area (which helps enzymes act on them). 	<p>Discusses (makes links between explanations)</p> <ul style="list-style-type: none"> Makes links between different parts of the digestive system to discuss how the parts work together to allow digestion to occur efficiently. <i>Efficiency is the idea of maximum food absorption and minimal water loss.</i> <p>Examples of possible discussions include:</p> <ul style="list-style-type: none"> Much chemical digestion of food occurs in the duodenum (first part of the small intestine). This is because many enzymes are released there in the bile from the gall bladder and fluid from the pancreas. For example, trypsin enzymes continue the digestion of proteins, which began in the stomach. Proteins need to be broken down into their smaller parts called amino acids. This is important because proteins themselves are too big to be absorbed through the villi on intestine walls, whereas amino acids are much smaller and can move through the intestine wall and the capillary wall into the bloodstream to be taken to places in the body that require them. Once the nutrients have been absorbed through the intestine wall via the villi, what remains is then passed into the large intestine through the action of peristalsis. Having had the nutrients removed, the function of the large intestine is to now remove excess water from the food material. This is important because loss of excess water, when the waste is egested, can lead to dehydration of the mammal. This is prevented through the action of the large intestine. Different enzymes work best / have different optimum pH's, and if the pH is incorrect, the enzyme will denature – the substrate will no longer fit into the enzyme's active site. Because of this, the digestive system is divided into sections / organs each with the correct pH for the enzyme that works there e.g. Mouth pH = 7ish regulated by the production of neutral saliva so that salivary amylase can digest starch into maltose. Stomach pH = 2ish regulated by the production of acid, HCl, so that pepsin can digest protein into polypeptides. Small intestine pH = 7ish regulated by the addition of bile (from the gall bladder) and / or

		<ul style="list-style-type: none"> • The pancreas releases enzymes and sodium bicarb / bile to neutralise stomach acid. The stomach acids need to be neutralise because different enzymes work in specific pHs, • The small intestine is the primary place for absorption of food. Villi (and microvilli) increase surface area allowing for faster absorption. • The large intestine absorbs excess water from remains of the food to reduce water loss (to avoid dehydration). 	<p>bicarbonates salts from the pancreas allow the enzymes amylase to digest maltose into glucose, trypsin to digest polypeptides into amino acids and lipase to digest fats into fatty acids and glycerol.</p> <p>Etc.</p>
--	--	---	--

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 idea.	Explains THREE relevant ideas.	Makes links between the functioning of TWO parts of the digestive system to allow digestion to occur effectively.	Makes links between the functioning of THREE parts of the digestive system to allow digestion to occur effectively.

Q	Achievement	Merit	Excellence
THREE	<p>Describes (single, simple ideas):</p> <ul style="list-style-type: none"> • The function of the heart / veins / arteries / capillaries / lymph system. <p>Examples of possible descriptions include:</p> <ul style="list-style-type: none"> • The circulation system acts to transport oxygen / waste / nutrient / hormones / heat around body • The heart acts as a pump to pump blood around the body. • The veins transport de-oxygenated blood back to the heart (except the pulmonary). • The arteries transport oxygenated blood from the heart around the body (except the pulmonary). • Capillaries transport blood (with nutrients) to the body cells. • Capillaries transport waste products (of respiration) away from the cells (for removal). • Veins have valves that prevent blood flowing in the wrong direction. • Capillaries pick up digested food / assimilation / products of digestion / molecules from the intestine to take to the body cells for use / respiration. • Capillaries are part of the villi that increase surface area for absorption of digested food / products of digestion / molecules. • The lymph system absorbs the products of fat digestion (fatty acids and glycerol) which are then absorbed into the bloodstream for transport around the body. • Products of digestion transport around the body to produce energy (ATP / cellular respiration). 	<p>Explains (gives reasons and examples):</p> <ul style="list-style-type: none"> • How parts of the circulation system work. <p>Examples of possible explanations include:</p> <ul style="list-style-type: none"> • The heart provides the pump to move the blood around the body. This is required because the products of digestion need to be transported from the intestine to cells around the body that require the products, e.g. glucose needs to be moved to the muscle cells, as they have a high energy demand to allow movement. • The arteries are needed so that blood can be transported with the nutrients (and oxygen) to the body cells from the intestines / gut / alimentary canal, where digestion occurs to places in the body that the nutrients are used. • The capillaries are very fine blood vessels that arise from the fine branching of the arteries. Capillaries, because they are so fine / small allow the products of digestion to enter the individual cells where they are required for use, e.g. in respiration within the cells. • Vast network of capillaries in microvilli which allow for efficient diffusion so that nutrients can be absorbed from small intestine to the bloodstream. • Veins transport nutrient-rich blood where the nutrients are offloaded to the liver for processing (hepatic portal vein) before being distributed by the heart. • Glucose (and other nutrients) from the breakdown of food transported by the arteries, veins, and capillaries can be used in cellular respiration / energy production. 	<p>Discusses (makes links between explanations).</p> <p>Examples of possible discussions include:</p> <ul style="list-style-type: none"> • The heart provides the pump to move the blood around the body. This is required because the products of digestion need to be transported from the intestine to cells around the body that require the product, e.g. glucose needs to be moved to the muscle cells as they have a high energy demand to allow movement. The arteries, capillaries, and veins form a network that can transport materials throughout the body. The arteries are needed so that blood can be transported, with the nutrients, to the body cells from the intestines / gut / alimentary canal where digestion occurs, to places in the body that the nutrients are used. In order for this to happen, the arteries direct blood into the much smaller and finer capillaries. These allow the products of digestion, e.g. glucose, to enter the individual cells, where they are used in cellular processes, e.g. respiration, which releases energy for life processes. • The heart provides the pump to move the blood around the body. The arteries are needed so that blood can be transported. This blood is pumped at a huge volume in the capillaries and/or microvilli to absorb nutrients. The concentration gradient created in the walls of intestines and the capillaries in the microvilli, which allows for effective and efficient absorption of nutrients, therefore allowing nutrients to be supplied to the cells that needed, in order for the cells to undergo cellular respiration. <p>Etc.</p>

N0	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 idea.	Explains THREE relevant ideas.	Discusses how TWO parts of the circulation system work together to effectively transport the products of digestion around the body.	Discusses how THREE parts of the circulation system work together to effectively transport the products of digestion around the body.

Cut Scores

Not Achieved	Achievement	Achievement with Merit	Achievement with Excellence
0 – 8	9 – 14	15 – 19	20 – 24