

**Assessment Schedule – 2022****Biology: Demonstrate understanding of biological ideas relating to a mammal(s) as a consumer(s) (90929)****Evidence Statement**

Q	Achievement	Merit	Excellence
ONE	<p><b>Describes</b> (single ideas, including definitions):</p> <ul style="list-style-type: none"> <li>Peristalsis is the waves of muscle contraction that causes food to <b>move</b> through the digestive system.</li> <li>Peristalsis involves the contraction and relaxation of muscles that line parts of the digestive system to help (move and) <b>mix</b> digested food.</li> <li>Peristalsis occurs in the stomach to help mix the food with <b>digestive juices / enzymes</b>.</li> <li>The function of the oesophagus – the oesophagus allows food to move from the mouth to the stomach.</li> <li>Food travels through the oesophagus as a bolus because of peristalsis.</li> <li>The function of the stomach e.g. the stomach is a storing place for food once it has been swallowed.</li> <li>Peristalsis helps digested food move through intestine to be absorbed / egested.</li> </ul>	<p><b>Explains</b> (gives reasons how or why something occurs / provides examples):</p> <ul style="list-style-type: none"> <li>how peristalsis occurs in one part of the digestive system</li> <li>how enzymes work</li> <li>the process of peristalsis</li> <li>how digestion occurs in one part of the digestive system (e.g. stomach).</li> </ul> <p><b>Example:</b></p> <ul style="list-style-type: none"> <li>Peristalsis moves food into the stomach, where it is mixed with enzymes and acid to be broken into smaller particles chemically and physically before moving into the small intestine so that it can be absorbed.</li> <li>Peristalsis is the waves of muscle contraction that causes food to move through the digestive system. It occurs because of the contraction and relaxation of the muscles in the intestine walls. Because of the waves of muscle contraction and relaxation, food is pushed in front of the muscle wave through the intestine.</li> <li>Explanation of rate of waves of peristalsis and how it varies across the intestinal tract, e.g. In the stomach peristaltic waves start as weak contractions at the beginning of the stomach, and progressively become stronger as they near the lower stomach regions. The waves help to mix the stomach contents and move food into the small intestine.</li> <li>In the small intestine, peristalsis helps mix the chyme and the enzymes released to help with breaking food down, so it is small enough for absorption (while also moving the mixture through to the large intestine.).</li> <li>The main purpose of peristalsis in the large intestine is to move undigested material through to the rectum for its eventual egestion as faeces, as wasted need to be removed.</li> </ul>	<p><b>Discusses</b> through comparing and contrasting, the function of peristalsis in different parts of the digestive system (oesophagus, stomach, small intestine, large intestine) to ensure food is digested efficiently and undigested food is egested.</p> <p><b>Example:</b></p> <p>In the stomach, digestive enzymes are added to the food so that chemical digestion can continue. For example, protease is added, which digests protein. Protease breaks the chemical bonds in the protein molecules so that they are broken down into amino acids for later absorption. HCl is also added in the stomach to help with the breakdown of larger food molecules into smaller food molecules. In the stomach, peristalsis is important because it helps to mix the food with the enzymes and HCl to ensure greater exposure of the food's surface area with the enzymes and HCl, thus speeding up the process of digestion in the stomach.</p> <p>In contrast to this, peristalsis also occurs in the small intestine. This is where the chyme and the enzymes are mixed to aid the breakdown of lipids and further breakdown of proteins. Digested food is broken down further, so it is small enough to be absorbed by the villi. The continual peristaltic waves help push digested food up against the small intestine walls to allow for efficient rate of absorption via villi (and microvilli.)</p> <p>The main functions of the large intestine are to reabsorb water and minerals, bacterial fermentation of undigested food and the formation and storage of faeces. Rather than mix food to increase surface area exposed to digestive juices, as occurs in the stomach, the main purpose of peristalsis in the large intestine is to move undigested material along the gut for its eventual egestion as faeces. The main functions of the large intestine are to reabsorb water and minerals, bacterial fermentation of undigested food and the formation and storage of faeces.</p>

<b>N0</b>	<b>N1</b>	<b>N2</b>	<b>A3</b>	<b>A4</b>	<b>M5</b>	<b>M6</b>	<b>E7</b>	<b>E8</b>
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.	Compares and contrasts peristalsis in ONE part of the digestive system.	Compares and contrasts peristalsis in TWO parts of the digestive system.

Q	Achievement	Merit	Excellence
TWO	<p><b>Describes</b> (single ideas, including definitions):</p> <ul style="list-style-type: none"> <li>the function of villi</li> <li>the structure of villi</li> <li>the function of a lacteal</li> <li>the function of capillaries inside a villus</li> <li>where villi are found</li> <li>how villi work</li> <li>how digested food gets from the gut to the villi</li> <li>the function of microvilli.</li> </ul> <p><b>Examples:</b></p> <ul style="list-style-type: none"> <li>Villi are found lining the inside of the small intestine wall</li> <li>Villi absorb digested food molecules through the gut wall and into the blood stream / assimilation</li> <li>Villi have blood vessels for absorption of <b>glucose and amino acids</b></li> <li>Villi have lacteals for the absorption of fatty acids and glycerol / products of fat</li> <li>Capillaries form a network inside a villus that pick up the digested food molecules which are then transported around the body in the circulation system.</li> <li>Villi / microvilli increase the surface area for absorption of digested food molecules.</li> <li>Villi walls are one cell thick / folded or microvilli</li> <li>Villi are found on the walls of the small intestine and not found on the wall of the large intestine (colon) / stomach.</li> </ul>	<p><b>Explains</b> (gives reasons how or why something occurs / provides examples):</p> <ul style="list-style-type: none"> <li>how absorption of digested food molecules occurs</li> <li>why villi are found only in some parts of the digestive system</li> <li>how villi and microvilli work</li> <li>why absorption of digested food is necessary.</li> </ul> <p><b>Examples:</b></p> <ul style="list-style-type: none"> <li>Villi absorb digested food molecules through the gut wall and into the blood stream. They are found only lining the inside of the small intestine wall. This is because by the time the food gets to the small intestine, it is partially digested, and digestion is completed there. The small intestine is therefore the main site in the digestive system where absorption of digested food molecules occurs.</li> <li>Capillaries form a network inside each villus that pick up the digested food molecules, which are then transported around the body via the circulation system. Capillaries form a network of vessels around the body cells / within the microvilli. This is called a capillary bed. This is so that each body cell has efficient access to the nutrients transported in the blood in the capillaries OR allow for efficient diffusion so that nutrients can be absorbed from small intestine to the bloodstream.</li> <li>Lacteals are also found inside each villus which absorb the fats and fat-soluble vitamins that are released by digestion because fat molecules are too large / need further processing to be absorbed into capillaries.</li> <li>The villi are <b>one-cell thick</b>, which allows for easier movement of particles into the capillaries and lacteals. Villi <b>increase the amount of surface area</b> available for efficient absorption and allow nutrients to be absorbed</li> <li>Other parts of digestive system do not have villi as they do not absorb nutrients, so do not need increased SA / Different parts of the intestines have different amounts of villi depending on what molecules are absorbed, e.g. small intestine have large amounts as they absorb digested molecules OR large intestine are smooth / have</li> </ul>	<p><b>Discusses</b> (makes multiple links between ideas) how villi increase the efficiency of the absorption of digested food, and why this is important to the overall survival of a consumer.</p> <p><b>Examples:</b></p> <p>Villi are found lining the inside of the small intestine wall. They absorb digested food molecules through the gut wall and into the bloodstream. Villi are only one-cell thick, thus <b>reducing the distance</b> required for digested food molecules to diffuse or be moved through the gut wall to be picked up by the capillaries. Capillaries form a network inside a villus, so that there is a <b>large surface area</b> to pick up the digested food molecules, which are then transported around the body in the circulation system. Both elements increase efficiency of absorption.</p> <p>OR</p> <p>The products of digestion are absorbed into capillaries through the walls of microscopic finger-like projections called villi, which line the walls of the intestine. The villi greatly increase the surface area available for the absorption of the products of digestion because each is inter-fused with capillaries, reducing the diffusion distance, thus allowing the process of absorption to occur with increased speed and efficiency.</p> <p>The capillaries in the microvilli feed into the hepatic portal vein (HPV). These capillaries have absorbed nutrients from the small intestine. HPV transport nutrient-rich blood where the nutrients are offloaded to the liver for processing before being distributed by the heart to the body cells via a network of arteries and capillaries where the nutrients are used in <b>cellular respiration</b> / energy production for survival.</p> <p>Different parts of the digestive system have different amounts of villi depending on what molecules are absorbed e.g., <b>Oesophagus has no villi as no absorption</b> is needed instead it allows food to pass from mouth from stomach. <b>Stomach has no villi as no absorption</b> is needed, instead used for storage of food, and mixing of food with enzymes and HCL to start digestion. The <b>small</b></p>

		<p>fewer villi as they absorb water / do not absorb digested molecules OR less absorption of nutrients occur in the stomach because they are too big.</p>	<p><b>intestine has large amounts of villi as</b> they absorb digested molecules into the blood stream hence need a <b>large surface area for efficiency</b> AND large intestine are smooth / have fewer villi as they absorb water into the blood stream / <b>do not absorb digested molecules</b>. Villi would slow down the movement of food as the food becomes more solid / faeces.</p>
--	--	---	--

<b>NØ</b>	<b>N1</b>	<b>N2</b>	<b>A3</b>	<b>A4</b>	<b>M5</b>	<b>M6</b>	<b>E7</b>	<b>E8</b>
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.	Provides ONE relevant example of discussing (making multiple links).	Provides TWO relevant examples of discussing (making multiple links).

Q	Achievement	Merit	Excellence
THREE	<p><b>Describes</b> (single ideas, including definitions):</p> <ul style="list-style-type: none"> <li>• the function of the teeth</li> <li>• the functions of the different types of teeth</li> <li>• the function of saliva</li> <li>• the function of enzymes (amylase)</li> <li>• the types of digestion that occur in the mouth.</li> </ul> <p><b>Examples:</b></p> <ul style="list-style-type: none"> <li>• Physical digestion is the chewing and cutting with the teeth, and the mixing of the food with the tongue.</li> <li>• Physical digestion of food by cutting food up into smaller pieces / increase surface area.</li> <li>• Chemical digestion occurs in the mouth through the enzyme amylase which is found in saliva.</li> <li>• Chemical digestion helps break down large food molecules into smaller food molecule.</li> <li>• Addition of saliva to help food pieces stick together into ball / bolus.</li> <li>• Enzymes are involved in the process of (chemical) digestion of food / speed up digestion.</li> <li>• Different types of teeth help breakdown food e.g., molars for chewing / canine for tearing.</li> </ul>	<p><b>Explains</b> (gives reasons how or why something occurs / provides examples):</p> <ul style="list-style-type: none"> <li>• the purpose of digestion in the mouth</li> <li>• how amylase works</li> <li>• how digestion occurs in the mouth.</li> </ul> <p><b>Examples:</b></p> <ul style="list-style-type: none"> <li>• The purpose of digestion in the mouth is to begin the process of the breakdown of food from larger pieces to smaller pieces so that they can be easily swallowed, thus allowing the food to travel down to the stomach for digestion. The food in the mouth is mixed with saliva so that it is lubricated because it needs to be able to be easily swallowed to move down into the oesophagus.</li> <li>• Chewing breaks food into smaller pieces which increases the surface area available for digestive enzymes to access and increases the rate of digestion.</li> <li>• In the saliva, amylase is present. Amylase is an enzyme that digests starch, breaking it down into simple sugars, such as glucose, so that it can be easily absorbed through the gut wall / glucose used by body for energy</li> <li>• Production of saliva also helps maintain a suitable pH level inside the mouth to allow for efficient enzyme function and protection of tooth enamel.</li> <li>• Physical digestion e.g., mastication / chewing breaks the food into small bits with larger surface area. This occurs due to different types of teeth working together, e.g., incisors bite food and the tongue helps move food around the mouth so that food could move to the back of the mouth where the molars chew / grind food.</li> </ul>	<p><b>Discusses</b> (makes multiple links between ideas) how the teeth, tongue, saliva, and enzymes work together to ensure the efficient start of the process of digestion of food in the mouth, and the importance of this process to the survival of a consumer.</p> <p><b>Examples:</b></p> <p>The purpose of digestion in the mouth is to begin the process of the breakdown of food from <b>larger pieces to smaller pieces, so that they can be easily swallowed</b>, thus allowing the rest of the digestive process to occur. Without the breaking down of large pieces of food into smaller pieces by the <b>physical digestive processes</b> in the mouth, it would not be possible for food to enter the digestive system at all, and the consumer would starve. In order for the food to easily enter the digestive system, it needs to be bundled into a small swallowable lump called a bolus. In order to form a bolus, the food in the mouth is mixed with saliva so that it is lubricated so that it is easily swallowed to move down into the oesophagus. In the saliva, amylase is present. Amylase is an enzyme that digests starch, breaking it down into simple sugars such as glucose so that it can <b>be easily absorbed</b> through the gut wall.</p> <p>Both physical and chemical digestion are needed for effective / efficient extraction of nutrients from the food; physical digestion occurs in the mouth through the breaking down of food through movement e.g. mastication of teeth (molars grinding etc.), mixing of tongue, peristaltic movements of muscles. This breaks up the large bits into smaller bits, increasing the surface area of the food bits so that <b>chemical digestion can be more efficient</b>. Chemical digestion is also needed; enzymes break down the <b>small bits using enzymes</b> (breaking bonds) <b>down into molecules small enough to be absorbed</b> into the bloodstream. Carbohydrates are broken down into maltose, then glucose by amylase. Protein is broken down into amino acids by pepsin and trypsin and fats are digested by lipase into fatty acids and glycerol.</p> <p>Physical and chemical digestive processes are both</p>

			<p>required in order for food to be digested efficiently. Both <b>physical and chemical digestion occur at various stages in the overall process of digestion</b>. For example, both types of digestion occur in the mouth, where the process of digestion begins. Physical digestion occurs in the mouth through the processes of biting and chewing. These processes are important because they allow for the initial larger pieces of food to be broken down into smaller pieces. This is important because it creates a <b>greater surface area</b> for the enzymes involved in chemical digestion to act on and makes the food small enough for swallowing. As this occurs, chemical digestion also begins in the mouth with the secretion of saliva. Saliva contains an enzyme called amylase, which is able to break starch molecules down into smaller glucose molecules. This is necessary because starch molecules are too large to be absorbed through the walls of the digestive system, but glucose molecules are smaller and can be absorbed through the gut wall.</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 ideas.	Explains at least THREE relevant ideas.	Provides ONE relevant example of discussing (making multiple links).	Provides TWO relevant examples of discussing (making multiple links) and linked to the importance of digestion in the mouth.

**Cut Scores**

Not Achieved	Achievement	Achievement with Merit	Achievement with Excellence
0 – 7	8 – 14	15 – 19	20 – 24