Grade 4.

Science and Technology.

1. Living Things.

1.2 Animals.

1.2.3 Human Body – The Digestive System.

The digestive system is a group of organs and processes responsible for breaking down food, absorbing nutrients, and eliminating waste from the body. It allows us to convert the food we eat into energy and provides the essential nutrients our bodies need to function properly.

The major organs of the digestive system include the mouth, esophagus, stomach, small intestine, large intestine, rectum, and anus. Each organ plays a specific role in the digestion and absorption of nutrients.

The digestive process begins in the mouth, where food is chewed and mixed with saliva, which contains enzymes that start the breakdown of carbohydrates. The tongue helps in the formation of a food bolus, which is then swallowed and passes through the esophagus to reach the stomach.

In the stomach, food is mixed with gastric juices, including hydrochloric acid and digestive enzymes, which further break down the food into a semi-liquid mixture called chyme. The stomach also secretes mucus to protect its lining from the acid.

From the stomach, the chyme enters the small intestine, where the majority of digestion and nutrient absorption occurs. The small intestine is divided into three sections: the duodenum, jejunum, and ileum. Here, digestive enzymes from the pancreas and bile from the liver and gallbladder help break down proteins, fats, and carbohydrates. The lining of the small intestine is covered in tiny finger-like projections called villi, which greatly increase the surface area available for nutrient absorption into the bloodstream.

The remaining undigested and unabsorbed material, along with water, electrolytes, and some vitamins, moves into the large intestine (colon). The colon absorbs water and electrolytes, while bacteria present in the colon help break down remaining indigestible material and produce certain vitamins, such as vitamin K. The waste material, in the form of feces, is stored in the rectum and eliminated through the anus during a bowel movement.

1.2.3.1 Parts of The Digestive System.

Mouth: The mouth is responsible for the initial mechanical digestion of food through chewing, which breaks down the food into smaller pieces. Saliva, produced by the salivary glands in the mouth, contains enzymes (such as amylase) that begin the chemical digestion of carbohydrates.

Esophagus: The esophagus is a muscular tube that transports food from the mouth to the stomach through rhythmic contractions called peristalsis.

Stomach: The stomach is a muscular organ that continues the mechanical and chemical digestion of food. It secretes gastric juices, including hydrochloric acid and enzymes (such as pepsin), which break down proteins. The stomach mixes food with gastric juices to form a semi-liquid mixture called chyme.

Small Intestine: The small intestine is the longest part of the digestive system and is divided into three sections: the duodenum, jejunum, and ileum. It plays a crucial role in digestion and nutrient absorption. The walls of the small intestine contain specialized structures called villi and microvilli, which increase the surface area available for absorption. Enzymes from the pancreas and bile from the liver aid in the breakdown of proteins, fats, and carbohydrates, while the lining of the small intestine absorbs nutrients such as amino acids, glucose, and fatty acids.

Pancreas: The pancreas is both an endocrine and exocrine gland. Its exocrine function involves the production and release of digestive enzymes into the small intestine. These enzymes, including amylase, lipase, and proteases, aid in the digestion of carbohydrates, fats, and proteins, respectively.

Liver: The liver has multiple functions in the body, including its role in digestion. It produces bile, a substance stored and concentrated in the gallbladder before being released into the small intestine. Bile helps in the breakdown and absorption of fats by emulsifying them into smaller droplets.

Gallbladder: The gallbladder is a small organ that stores and releases bile produced by the liver. When fat is present in the small intestine, the gallbladder contracts, releasing bile through the bile duct into the small intestine to aid in fat digestion.

Large Intestine (Colon): The large intestine is responsible for the absorption of water and electrolytes from undigested food, forming feces. It also hosts beneficial bacteria that assist in the breakdown of remaining indigestible materials and the production of certain vitamins, such as vitamin K.

Rectum: The rectum is the final section of the digestive tract, where feces are stored until they are eliminated through the anus during a bowel movement.

The Digestive System