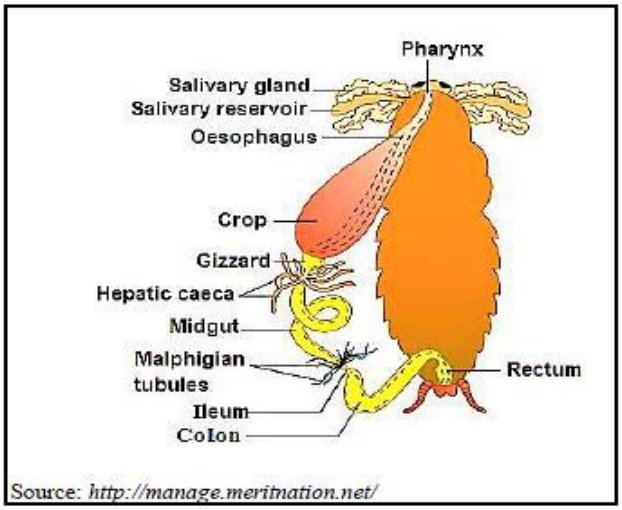
Year/Level: 12C/D week 14 **Subject:** Biology

Strand	1 structure & life processes
Sub Strand	1.4 comparative form and function in plants and animals
Content Learning Outcome	Discuss the process of digestion in selected organisms.(Arthropods)

Nutrition in Arthropods

- Arthropods are the most successful animal phylum of all.
- With all of the diversity, arthropods vary greatly in their diets and therefore, in their guts. We will study the cockroach digestive system as an example.
- Arthropods have a '**complex-tube like gut'** system.
- Insects gut has a greater number of specialised chambers than an annelid gut, including special organs for secreting enzymes and absorbing water from the faeces.



Cockroach Nutrition

1. A cockroach *cuts up its food* with mouthparts called **mandibles** and *holds its food* with **maxillae**. Saliva from the salivary glands *moistens the food*.
2. The **crop** stores food and the **gizzard** *grinds it*, just as in an earthworm.
3. The caecum (pronounced see-cum) secretes digestive enzyme into the mid-gut. (This organ is particularly important in herbivorous insects).
4. The **mid gut** *digests and absorbs food*.
5. The **hind – gut** *absorbs water* from the faeces. This is extremely important for water conservation in terrestrial insects.
6. Indigestible food is egested out through the anus.
7. The blood absorbs digested food from the mid- gut and carries it to the insects body cells.

Intestinal Parasites

- Many animals from flies to humans get infected with intestinal parasites which obtain their food from their host animal.
- The two main types of intestinal parasites are the Helminths and Protozoa.
- Helminths are the worm-like parasites with many cells.

- Examples of helminthes are hookworms, flatworms, roundworms, tapeworms.
- Protozoa is a single-celled animal-like microscopic organism that cannot survive in the absence of water.
- A common intestinal protozoan is Giardia, Crystosporidium.
- Parasites can get entry into the intestines through the mouth from uncooked or unwashed food, contaminated water or hands, or by skin contact with larva in infected soil.
- These parasites do not need a digestive system of their own since food in the small intestine of the host has already been digested by the host.
- Intestinal worms have evolved to absorb digested food directly from their host's intestine. All they need to do is to hold on and reproduce.
- Therefore, they only have organs for attachment and reproduction

Vertebrate Animal Digestive System

- Vertebrate animals have the most **complex digestive systems** of all.
- They have two gut opening and long alimentary canals divided into many specialised chambers
- Unlike the digestive system of annelids and arthropods where the digested food is absorbed by the blood and nutrients are transported to all the body cells.
- In year 11, we had studied the human digestive system, this year we will focus on the digestive system of few other vertebrates such as birds, some herbivores and carnivores.

Activity

1. Describe two ways grasshoppers are adapted for eating grass.

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2. What is the advantage of a gut with two opening over a gut with just one?

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3. Why do you think insects do not have external digestion or a sac – like gut?

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4. Make three points of comparison between the digestive system of a jelly fish and an earthworm. Relate each point to the lifestyle of the organisms.

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5. Why doesn't an intestinal parasite have a digestive system?

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