

## Animal Survival      *Checklist*

### *The Need for Food (\* = Credit outcomes)*

1. Plants make food by **photosynthesis**; animals must eat plants or other animals to get food
2. Food contains **chemical energy**.
3. **Carbohydrates** (sugars and starches) are used for **energy**.
- 4\*. They contain the elements **carbon, hydrogen** and **oxygen**.
- 5\*. The basic units of carbohydrates are **glucose sugar** molecules.
6. **Fats** are used for insulation and as a **store of energy**.
- 7\*. They contain the elements **carbon, hydrogen** and **oxygen**.
- 8\*. The basic units of fats are **fatty acids** and **glycerol**.
9. **Proteins** are used for **growth** and **repair of body tissues**.
- 10\*. They contain the elements **carbon, hydrogen, oxygen** and **nitrogen**.
- 11\*. The basic units of proteins are **amino acids**.
12. **Vitamins** and **minerals** are also needed for **healthy growth** and proper **functioning** of the **body**.
13. **Digestion** is the breakdown of **large particles** into **smaller particles** of food.
14. This allows the food to be **absorbed** through the wall of the **small intestine**.
- 15\*. Digestion involves breaking down **insoluble** food into **soluble** food.
16. Food is **mechanically** broken down by the teeth and **chemically** broken down by **enzymes**.

17. There are 4 types of tooth - **incisor, canine, premolar** and **molar**.
18. In **herbivores** (eg sheep), the incisors in the lower jaw bite against a hard pad in the upper jaw to cut grass; the canines in the lower jaw are similar to the incisors and there are no incisors or canines in the upper jaw; the premolars and molars are **deeply ridged** for chewing and grinding grass.
19. In **carnivores** (eg dogs), the incisors are used for biting; the canines are **large and pointed** for holding prey and ripping prey; the premolars and molars are used for crushing bones; the 4th premolar in the upper jaw and the 1st premolar in the lower jaw form the **carnassial teeth** for slicing flesh.
20. In **omnivores** (eg humans), the incisors are used for biting; the canines for tearing; the premolars and molars are used for chewing and grinding.
21. The alimentary canal is composed of the following parts and associated organs:- **mouth, salivary glands, oesophagus (gullet), stomach, pancreas, liver, gall bladder, small intestine, large intestine, rectum, anus.**
- 22\*. **Digestive juices** are produced by the salivary glands, stomach, pancreas, liver and small intestine.
- 23\*. **Peristalsis** is a wave of **muscular contractions** that moves food through the gut. The muscles in front of the food relax and those behind the food contract. This pushes the food through the gut.
- 24\*. When food is in the stomach it gets mixed with **hydrochloric acid** and the enzyme **pepsin**. Muscular contractions of the stomach wall ensure that the food and digestive juices are completely mixed. The acid kills bacteria and allows the pepsin to work properly.
25. Carbohydrates are broken down by enzymes called **amylases**.
- 26\*. **Salivary amylase** from the salivary glands acts on the substrate **starch** and converts it into the product **maltose**. This is further broken down by pancreatic amylase into **glucose**.
27. Proteins are broken down by enzymes called **proteases**.
- 28\*. Pepsin from the stomach wall acts on the substrate protein and converts it into **peptides** and **polypeptides**. These are further broken down by pancreatic proteases into **amino acids**.
29. Fats (or lipids) are broken down by enzymes called **lipases**.

- 30\*. **Pancreatic lipase** from the pancreas acts on the substrate **fats** and **oils** and converts them into **fatty acids** and **glycerol**.
31. The small intestine is **very long** ( nearly 7 metres) and is **heavily folded** to create a **very large surface area** for the breakdown and absorption of foods. The surface area is further increased by the presence of **finger-like projections** called **villi**. The **wall** is **very thin** allowing digested foodstuffs through quickly into the bloodstream. The wall is well supplied with **blood capillaries** to **transport** the digested foodstuffs away.
- 32\*. Each villus has a thin lining allowing rapid movement of digested foods.
33. Products of protein digestion (amino acids) and carbohydrate digestion (glucose) are absorbed into the capillaries.
34. Products of fat digestion (fatty acids and glycerol) are absorbed into the **lacteal**.
33. The waste enters the large intestine where **water is removed** and the remains, called **faeces**, is stored in the rectum and **eliminated** through the anus.