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| **D.1.U1** | * Define “essential” as related to dietary nutrients.
* Define “non-essential” as related to dietary nutrients.
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| **D.1.U2** | * State the difference between a vitamin and a mineral.
* List two example essential minerals.
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| **D.1.U3** | * Define vitamin.
* Compare the properties of water soluble and fat soluble vitamins.
* List two example water soluble vitamins and two example fat soluble vitamins.
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| **D.1.U4** | * Outline the concept of “conditionally essential” using amino acid examples.
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| **D.1.U5** | * Outline the effect of protein deficiency malnutrition on children and adults.
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| **D.1.U6** | * Outline two causes of malnutrition.
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| **D.1.U7** | * Describe how hormones and the appetite control center regulate a desire to eat.
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| **D.1.U8** | Define hypertension.* List risk factors associated with type II diabetes.
* State symptoms of type II diabetes.
* List cardiovascular effects of type II diabetes.
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| **D.1.U9** | * Explain loss of muscle mass during starvation.
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| **D.1.A1** | **Production of ascorbic acid by some mammals, but not others that need a dietary** **supply.** |

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| **D.1.A2** | Outline the genetic cause of phenylketonuria.* List consequences of phenylketonuria if untreated.
* State how phenylketonuria is treated.
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| **D.1.A3** | * Explain the relationship between vitamin D, calcium, osteomalacia and skin cancer.
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| **D.1.A4** | * List symptoms associated with anorexia nervosa.
* Outline the effect of anorexia nervosa on heart muscle tissue.
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| **D.1.A5** | Outline factors that indicate that dietary cholesterol may not be the exclusive cause of the correlation between blood plasma cholesterol levels and risk of coronary heart disease.  |

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| **D.1.S1** | Explain how a calorimeter can be used to determine the energy content in food.* Calculate the energy content of a food sample using calorimetry data.
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| **D.1.S2** | **Use of databases of nutritional content of foods and software to calculate intakes** **of essential nutrients from a daily diet.** |

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| **D.1.****NOS** | **Falsification of theories with one theory being superseded by another—scurvy was** **thought to be specific to humans, because attempts to induce the symptoms in laboratory****rats and mice were entirely unsuccessful.** |

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| **D.2.U1** | * Describe when the secretion of digestive juices must be controlled.
* State to mechanisms by which secretion of gastric juices is controlled.
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| **D.2.U2** | * Define alimentary canal.
* Contrast endocrine glands with exocrine glands.
* Label a diagram of an exocrine gland with the following terms:  secretory cells, lumen,

duct, secretory vesicles, basement membrane and acinus.* Discuss the relationship between the structures of an exocrine gland cell and the
* function of the cell.
* State the name and location of three exocrine glands associated with the

alimentary canal.* State the composition of saliva, gastric juice and pancreatic juice.
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| **D.2.U3** | * Using a flow chart or concept map, diagram the interactions between nervous

and hormonal mechanisms that regulated the secretion of gastric juices. |

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| **D.2.U4** | * Outline three roles of acid in the stomach.
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| **D.2.U5** | * Outline the role of the following structures of villi epithelial cells:  tight junctions,

microvilli, mitochondria, pinocytic vesicles, proteins imbedded on the apical surface and proteins imbedded on the basal surface. |

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| **D.2.U6** | * List benefits of fibre in a healthy diet.
* State the relationship between food fibre contents and rate of transit through

the large intestine. |

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| **D.2.U7** | * Define dietary fibre.
* State two examples of dietary fibre.
* Define egestion.
* List materials that are egested from the body.
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| **D.2.A1** | * State the role stomach mucus.
* State the cause of ulcer and acid reflux.
* Outline the role of the H+, K+ -ATPase protein pump in the production of an
* acidic stomach.
* Outline the use, function and effect of proton pump inhibitors to treat gastric

disease. |

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| **D.2.A2** | * Outline the cause and consequences of cholera infection.
* Explain the effect of cholera toxin on intestinal cells.
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| **D.2.A3** | * Define stomach ulcer.
* Outline evidence that suggest *Helicobacter pylori* infection has a role in stomach

 ulcer and stomach cancer. |

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| **D.2.S1** | * List three features that can be used to identify exocrine gland cells as viewed

 in electron micrographs.* List four features that can be used to identify villus epithelium cell as viewed

in electron micrographs. |

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| **D.2.****NOS** | * Describe how William Beaumont was able to determine the role of the stomach in
* chemical digestion of food.
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