**Anatomy and Physiology**

**Digestion and Nutrition Unit**

**Introduction:**

In this unit we will examine how the digestive system is adapted to supply us with the materials we need for energy and to build our body. We’ll also assess our diet in light of our metabolic needs. After all, we are what we eat…

**Essential questions:**

How are the structures of the organs in our body adapted for their functions?

How does understanding our metabolic needs influence our diet?

**Objectives:**

1. For each of the following digestive organs and glands, describe its structure and its function.

* Mouth
* Teeth
* Salivary Glands
* Pharynx
* Esophagus
* Stomach
* Small Intestine
* Large Intestine (colon)
* Pancreas
* Liver
* Gallbladder

1. Identify digestion organs and glands on a diagram.
2. Describe the six processes needed for food digestion (ingestion, propulsion, mechanical digestion, chemical digestion, absorption, defecation).
3. Describe the locations and enzymes (including their substrates and products) involved in the chemical digestion of carbohydrates.
4. Describe the locations and enzymes (including their substrates and products) involved in the chemical digestion of proteins.
5. Describe the locations and enzymes (including their substrates and products) involved in the chemical digestion of lipids.
6. Explain how the mouth, pharynx, epiglottis and esophagus act during swallowing and prevent choking.
7. Describe how peristaltic waves propel food through the esophagus, stomach and intestines.
8. Explain the role of hormones in regulating diet (table 14.2).
9. Explain how the stomach is adapted for its function.
10. Explain how the small intestine and large intestine are adapted for their functions.
11. Explain the roles of carbohydrates, lipids, proteins, vitamins, and minerals in our metabolism.
12. Explain how carbohydrates, fats and lipids are metabolized.
13. Describe the events of cellular respiration and how carbohydrates, fats and proteins can serve as fuel sources.
14. Describe the role of the liver in metabolism of carbohydrates, fats (especially cholesterol), and proteins.
15. Explain the concept of body energy balance. Define calorie.
16. Describe factors that affect our metabolic rate.
17. Explain basal metabolic rate and total metabolic rate.
18. Describe the process of glycolysis.
19. Describe the process of fermentation.
20. Describe the process of cellular respiration.
21. Explain how the body uses negative feedback to maintain a constant temperature.

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| Day | Topic | Homework |
| 1 | Vital signs case  Digestion video | Obj 1 |
| 2 | Intro to digestive system  Alimentary canal anatomy and physiology | Obj 3, 7, 8 |
| 3 | Alimentary canal anatomy and physiology con’t | Obj 9-11 |
| 4 | Chemical digestion of carbs, lipids, proteins | Obj 4-6 |
| 5 | Nutrition requirements | Obj 12-13, 15-18 |
| 6 | BMI, BMR and fast food | Obj 14, 19-22 |
| 7 | Temperature regulation | Case study |
| 8 | Nutrition case study | Finish case study |
| 9 | Metabolism case study | Review questions |
| 10 | Metabolism case study con’t | Digestion story due |
| 11 | Review | Study |
| 12 | Review | Study |
| 13 | Unit exam |  |
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