**BIOCHEMISTRY UNIT GUIDE ANSWERS**

**Recall and Review:** Use the lecture in the video and your textbook to help you answer the following questions in your 3-ring binder. ANSWER IN FULL SENTENCES.

**Chapter 2 Questions**

1. Explain the difference between a monomer and polymer.

**A monomer is a single molecule that combines with other monomers to form a polymer (3 or more monomers combined)**

1. Write your own analogy for the formation of a polymer from monomers.

**A possible analogy would a single lego for the monomer and a stack of legos connected together for the monomer.**

1. Complete the chart below

|  |  |  |
| --- | --- | --- |
| Macromolecule | Example | Function |
| **Carbohydrate** | **Sugar, starch** | **Short term energy supply** |
| **Lipid** | **Fats, oils, waxes** | **Long term energy, insulation** |
| **Protein** | **Enzyme, Keratin (hair and nail protein)** | **Speed up chemical reactions, provide structure** |
| **Nucleic acid** | **DNA, RNA** | **Heredity** |

1. State the two parts of a chemical reaction.

**The reactants are the part that go into the chemical reaction and the products are the result of the chemical reaction.**

1. Define activation energy.

**The amount of energy required for a chemical reaction to be started (think of it as the push necessary to slide down a sliding board)**

1. State the role of enzymes in organisms.

**The role of enzymes is to speed up chemical reactions.**

1. How are phospholipids similar to lipids such as triglycerides? How are they different?

**They are similar in that they both contain fatty acids and glycerol. They are different in that a triglyceride has three fatty acids while a phospholipid has two fatty acids and one phosphate group.**

1. The human body can reuse some of the enzymes found in raw fruits and vegetables. Why is this not the case for cooked fruits and vegetables?

**By cooking fruits and vegetables we raise the temperature too high. This high temperature denatures (or changes the shape of the enzyme) and makes it unusable.**

1. What are the advantages and disadvantages of eating a “nutritionally engineered” product versus relying on a balanced diet to maintain health?

|  |  |  |
| --- | --- | --- |
| Nutrition | Nutritionally Engineered | Balanced Diet |
| Advantages | **You would definitely be receiving all of the essential vitamins and minerals** | **You would get to choose how you obtain your essential vitamins and minerals by eating the foods you prefer to eat.** |
| Disadvantages | **The nutrients will not be in their natural form so they may not be as effective as natural vitamins and minerals, you do not get to choose the food you eat.** | **If you do not eat a truly well balanced diet you may not obtain all of the necessary nutrients.** |

1. Scientific Method:

Biology students were asked to find out if some foods provided more energy. During lunch they provided different snacks to everyone.

A-lunch students ate the school lunch but did not receive any snacks.

B-lunch students ate the school lunch and a cereal bar (full of carbohydrates).

C-lunch students ate the school lunch and a nut/dark chocolate candy (full of lipids)

At the end of the school day the biology students survey the students to find out how the students from different lunch felt.

1. What is a hypothesis for this experiment?

**If we provide students with different types of snacks, some snacks will provide more energy than others.**

1. What is the control group? What is the experimental group?

**Group that did not receive an snacks is the control, the experimental groups are the ones that received the different types of snacks.**

1. Define the independent and dependent variables.

**Independent variable = the type of snack (ceral bar, nut/dark chocolate)**

**Dependent variable = Results of the survey based on how students felt.**

1. Identify 2 constants in this experiment.

**All students were from Biology class so are approximately the same age, received the snacks at the same time of day (lunch)**

1. Based on your knowledge and properties of biomolecules, predict what the result of this experiment would be? Explain your answer.

**It is likely that the students that received the cereal bar would have more energy than the students with the candy or no snacks. This is because the end of the school day is only a couple of hours after lunch and carbohydrates provide the best short term energy.**