

Chapter 6 Warning:

The chemical reactions discussed in chapter 6 are extremely detailed and overwhelming to read about. Try to look at the big picture in each reaction: What is the purpose of the diagram? What concept is Hillis trying to illustrate? Focusing on the caption for the figures may help to simplify what is being illustrated. It is strongly recommended that you attempt the chapter questions a few days before they are due; this will give you a chance to identify the most difficult concepts and get help in understanding them.

CHAPTER 6.1–6.4

*At least 50% of this assignment is due in class on Wednesday, October 25, 2017
The completed assignment, in its entirety, is due Thursday, October 26, 2017*

Read Hillis Chapter 6.1–6.4 and answer the first concept questions in 6.1, the second and third concept questions in 6.2, and all the concept questions in 6.3 and 6.4 using complete sentences.

CHAPTER 6.5–6.6

*At least 50% of this assignment is due in class on Thursday, November 2, 2017
The completed assignment, in its entirety, is due Friday, November 3, 2017*

Read Hillis Chapter 6.5 and 6.6 and answer the first and third concept questions in 6.5 and both concept questions in 6.6 using complete sentences.

ESSAY 4

Due Wednesday, November 8, 2017

Answers must be written out in paragraph form. Outline form is not acceptable. Labeled diagrams may be used to supplement discussion, but a diagram without a written explanation will not receive credit. You must cite the source of all information you mention. Include the page number of information from the textbook or the web address of information found online.

Twenty stalks of *Elodea*, an aquatic plant, were massed and randomly assigned to one of two treatment groups. Stalks in group I were kept in complete darkness for 48 hours and stalks in group II were kept in light for 48 hours. After the 48-hour period, the masses were remeasured. The data are as follows.

Group	Treatment	Initial Mass (g)	Final Mass (g)
I	Dark	15.10	12.92
II	Light	14.99	16.31

- Identify** the cellular process responsible for the change in mass in the stalks in group I and **provide reasoning** to connect the process with the decrease in mass. **Describe** how a step in this process consumes ATP.
- Using the data in the table, **justify** the claim that the *Elodea* stalks in group II performed photosynthesis during the 48-hour period between measurements. **Describe** how a step in this process consumes ATP.
- Over the 48-hour period between measurements, an increase in oxygen concentration can be detected in the water that the *Elodea* in group II are submerged in. **Identify** the inorganic source of the oxygen being formed and **propose** an explanation to connect it to the formation of carbohydrates in the *Elodea* cells.
- Describe** the structure of a specific membrane in the cells of the plant related to ATP production and **explain** how the structure contributes to the generation of ATP molecules.
- Connect** the observed mass change in group I to the observed mass change in group II.

CHAPTER 7

*Approximately 75% of this assignment is due in class on Monday, November 13, 2017
The completed assignment, in its entirety, is due Tuesday, November 14, 2017*

Read Hillis Chapter 7 and answer ALL concept questions (7.1–7.5) in complete sentences.

CHAPTER 8

*Approximately 75% of this assignment is due in class on Monday, November 20, 2017
The completed assignment, in its entirety, is due Tuesday, November 21, 2017*

Read Hillis Chapter 8 and answer ALL concept questions (8.1–8.4) in complete sentences EXCEPT for the second question in concept 8.2.

CHAPTER 9

*Approximately 75% of this assignment is due in class on Monday, November 27, 2017
The completed assignment, in its entirety, is due Tuesday, November 28, 2017*

Read Hillis Chapter 9 and answer ALL concept questions (9.1–9.3) in complete sentences EXCEPT for the fourth question in concept 9.1 and the second question in concept 9.3.

ESSAY 5

Due Wednesday, November 29, 2017

Answers must be written out in paragraph form. Outline form is not acceptable. Labeled diagrams may be used to supplement discussion, but a diagram without a written explanation will not receive credit. You must cite the source of all information you mention. Include the page number of information from the textbook or the web address of information found online.

Several different crosses were performed using fruit flies, and the phenotypes of the parents and resulting offspring were recorded.

Cross I: A true-breeding normal-winged male was crossed with a true-breeding stunted-winged female. All the F₁ offspring had stunted wings. F₁ flies were crossed, and the data for the resulting F₂ flies are given in the table below.

F ₂ Phenotype	Male	Female
Normal wings	11	13
Stunted wings	36	38

Cross II: A true-breeding wild type male was crossed with a true-breeding white-eyed female. All of the males in the F₁ offspring had white eyes and all of the females in the F₁ offspring were wild type. F₁ flies were crossed, and the data for the resulting F₂ flies are given in the table below.

F ₂ Phenotype	Male	Female
Wild type	23	31
White eyes	22	24

Cross III: A true-breeding stunted-winged male with long aristae was crossed with a true-breeding normal-winged female with short aristae. All the F₁ offspring had stunted wings and long aristae. F₁ flies were crossed. Data from the resulting F₂ flies are not yet available.

- Determine** the modes of inheritance that occurred in cross I and cross II. **Provide reasoning** based on the data to support your conclusions for each cross.
- Perform** a chi-squared test on the F₂ generation data from cross II to analyze your predictions of the mode of inheritance. **Specify** the null hypothesis that you are testing, **show** all your work and **interpret** the meaning of your final answer.
- Pose** a scientific question that should be asked of the F₂ generation data from cross III to determine whether the loci for the genes controlling wing type and aristae length are located on the same chromosome. **Provide reasoning** to connect your question to the location of the genetic loci.