

Bio 1113, Week 7 Recitation
Photosynthesis festival!

Objectives by the end of this recitation section you should be able to:

1. Diagram the two phases of photosynthesis, their inputs and outputs, key molecular changes, and their locations in the cell.
2. Explain the role of cyclic and non-cyclic electron flow
3. Understand the causes and consequences of photorespiration
4. Contrast C3 photosynthesis with C4 and CAM photosynthesis, alternative photosynthetic pathways adapted to hot, dry environments
5. Recognize photosynthetic and non-photosynthetic tissues
6. Describe the role of photosynthetic pigments and identify examples of different pigments in the leaves of plants.
7. Identify storage organs and reproductive structures in plants

Pre-assessment: Answer the questions using the Likert scale (with 1 not at all and 5 meaning excellent)

1. How confident to you feel explaining the function of the two main phases of photosynthesis to another student? **(1 2 3 4 5)**
2. Could you list all of the inputs and outputs of the light dependent and light independent reactions? **(1 2 3 4 5)**
3. How well do you understand photorespiration? **(1 2 3 4 5)**
4. How well could you contrast the two alternative photosynthetic pathways with standard, C3 photosynthesis? **(1 2 3 4 5)**
5. Could you identify examples of different photosynthetic pigments in plant leaves? **(1 2 3 4 5)**

Activity 1: Decorative Diagrams.

Celebrate photosynthesis, the metabolic pathway that ecorate the paved paths of campus between Adena and Founders with colorful, accurate diagrams of photosynthesis. These should be aimed at educated individuals (students, faculty, staff) but not necessarily biology majors. Your diagram must be well labeled and communicate pictorially and in a few words the process you are describing.

1. Form small groups of up to 2 people. For each group, obtain chalk and a survey flag from the bucket.
2. In groups, choose one part of the photosynthetic pathway below and prepare a chalk drawing that clearly illustrates the key elements of the process. Find a place on the sidewalk to make your drawing.
3. Carefully draw out your pathway. If you get off track, start in a new place. Planning your drawing carefully beforehand will help you be more efficient with the chalk. It should be large enough to see detail easily. Your names should appear somewhere on the edge in legible letters.
4. When you have completed your drawing, place your survey flag by the drawing (upright) to indicate you are ready to explain your diagram to me. Once I have checked it for accuracy, please photograph it to upload with this assignment.

5. You and your partner will then browse the other diagrams in a “gallery walk”. If you have questions, please ask them of the artists.
6. “Vote” for your favorite two drawings other than your own by photographing them to upload with your assignment.
7. In the space below, paste your images (yours and the two others that you found helpful) and write full figure captions explaining in detail the process depicted. Make sure to use the appropriate terms and vocabulary.

Activity 2: Scavenger hunt

1. Find examples of as many of the organisms and structures listed below. Assemble them on the sidewalk with letters to indicate what they represent. If the item is too large to collect, then photograph and label it.
2. Check items with me before you leave.
3. Photograph your collection and paste it below.
4. List of items
 - a. primary photosynthetic pigments (chlorophylls)
 - b. secondary photosynthetic pigments (carotenoids)
 - c. a structure that has more than one type of pigment
 - d. a non-photosynthetic pigment in a plant structure
 - e. a non-photosynthetic tissue
 - f. a non-leaf photosynthetic tissue
 - g. a C3 plant
 - h. a C4 plant
 - i. a CAM plant
 - j. a structure or tissue that stores nutrients



CAUTION! If you are in or near wooded areas or in weedy patches, avoid this plant, Poison Ivy. It can give you a nasty rash if you touch any part of the plant. It might be turning red right now. Hand sanitizer helps remove the poison ivy oils from your skin and can prevent a rash.

Post-Assessment: Answer the questions using the Likert scale (with 1 not at all and 5 meaning excellent)

1. How confident to you feel explaining the function of the two main phases of photosynthesis to another student? **(1 2 3 4 5)**
2. Could you list all of the inputs and outputs of the light dependent and light independent reactions? **(1 2 3 4 5)**
3. How well do you understand photorespiration? **(1 2 3 4 5)**
4. How well could you contrast the two alternative photosynthetic pathways with standard, C3 photosynthesis? **(1 2 3 4 5)**
5. Could you identify examples of different photosynthetic pigments in plant leaves? **(1 2 3 4 5)**

