

RAFT IDEAS

Topics: Photosynthesis,
Summarization Skills

Materials List

- ✓ 10 card stock pieces or index cards
~ 8 cm x ~13 cm (~3"x~5")
- ✓ Binder clips that can hold at least 11 index cards
- ✓ 5-10 Green plastic game tokens
- ✓ Pencils and pens
- ✓ Optional: stickers, molecule cut-outs, glitter, markers

This activity can be used to teach:

English Language Arts:

- Write narratives; Informative texts; write w/organization (Writing, Grades 4-12, 1, 2, 3; Grades 6-12, Science/technical writing, 2, 4)
- Write dis.-specific content (Grades 6-12, Sci./tech. writing, 1)

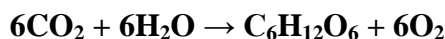
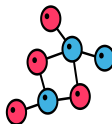
Next Generation Science:

- Plants (Life Sci, Grade 4, 1-1; Grade 5, 1-1)
- Cycles of matter and energy (Grade 5, Life Science 2-1)
- Photosynthesis (Life Sci., Middle Sch., 1-6, High Sch., 1-5, 2-5)
- Energy in food comes from sun (Grade 5, Physical Science 3-1)



Photosynthesis Review Books

Overview of a Chemical Process on which All Our Lives Depend!



Create personalized mini-books to review and see photosynthesis in a new light!

Assembly

1. Each student numbers cards on the bottom-right corner as 1, 2, 3 ... 11.
2. Stack the cards in ascending order (page 1 on top) and secure with binder clip.
3. In the table below are examples of suggested information that may be included in the book. Personalize pages by including drawings, pictures, colors, and stickers.

Page	Suggested Contents
1	Title and name
2	General definition of photosynthesis (in words)
3	Chemical equation for photosynthesis (balanced)
4	Internal structure of chloroplast
5	Summary of light-dependent reactions
6	Summary of light-independent reactions (e.g., Calvin Cycle)
7	Paragraph describing significance of photosynthesis to all life
8	Description of factors that affect photosynthesis (e.g., climate)
9-11	Defined list of vocabulary words relating to photosynthesis, (e.g., chlorophyll, grana, thylakoid, pigments).

To Do and Notice

Use completed review book to quiz a partner on specific details regarding photosynthesis, then switch roles. For each correct response, give the partner a green token ("chloroplast"). Examples of questions include: What are three molecules in the chemical equation for photosynthesis? Which ones are products of the reaction? What molecule do plants take in from the air? How does photosynthesis affect life on Earth? What role do pigments play in the process and where are they stored?

The Science Behind the Activity

Photosynthesis is an important but complicated process that can be summarized in an easy-to-read format that serves as a mnemonic device. In general, photosynthesis is the process by which plants make glucose (sugar) from carbon dioxide and water. Photosynthesis, however, involves several chemical reactions that occur in organelles called chloroplasts (see RAFT Idea Sheet *Plant Cells*). There are several reactions taking place, each with their own level of complexity and number of stages. Learners benefit from practicing and using summarization skills and tools. In this case a student-created book helps to illustrate how each individual part of the photosynthetic process contributes to plants making their own food, which impacts all life on Earth.

Taking it Further

- Include information on new developments in photosynthesis research

Web Resources (Visit www.raft.net/raft-idea?isid=628 for more resources!)

- Biochemical reactions in photosynthesis - <http://www.emc.maricopa.edu/faculty/farabee/biobk/biobookps.html>