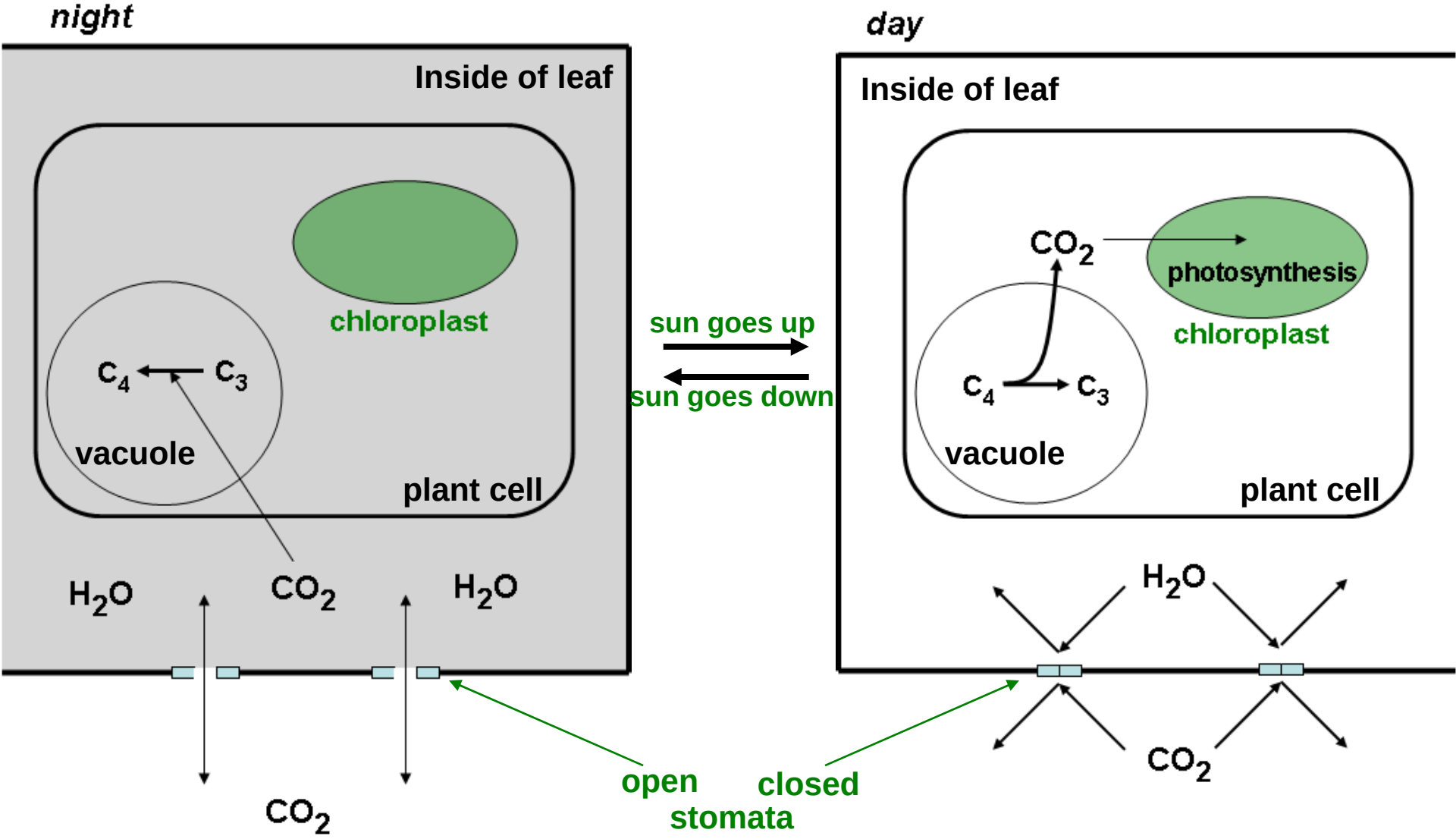
BIO 311C
Spring 2010

Exam 3 on Friday will consist of 45 multiple choice questions and 3 additional questions that require you to write answers directly on the exam.

You will need to bring a pencil (and perhaps a back-up pencil) to the exam on Friday. Nothing else will be required. You will not need, and should not use, a calculator during the exam.

Lecture 31 – Wednesday 14 Apr.

CAM Plants



Stomata open at night, allowing CO_2 to diffuse in. Somata close during the day, minimizing evaporative loss of water vapor.

CAM plants live in deserts where water loss must be minimized.

Their photosynthesis is less efficient than that of typical C_3 plants.

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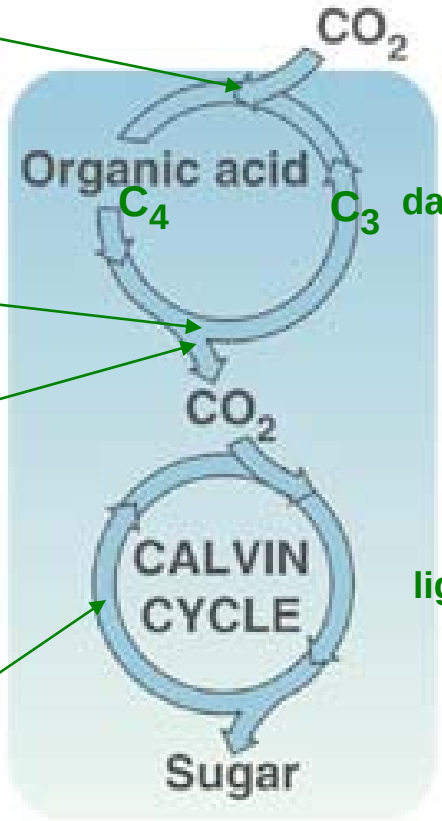
CAM Photosynthesis;
Occurs in many desert plants

1. CO_2 from the atmosphere is covalently bound to a C_3 organic molecule to produce a C_4 organic molecule in darkness while the leaf pores are open so photosynthetic cells are exposed to the atmosphere.

2. The C_4 organic molecule is transported by active transport from the chloroplast to the central vacuole by active transport.

3. At daybreak the leaf becomes sealed from the atmosphere. CO_2 is then released from the C_4 molecule. The regenerated C_3 molecule is then transported back to the chloroplast and the released CO_2 diffuses to the chloroplast, where it starts to accumulate at high concentration.

4. The Calvin Cycle has access to CO_2 during daylight even though the leaf is sealed from the atmosphere.



From textbook Fig. 10.20, p. 202

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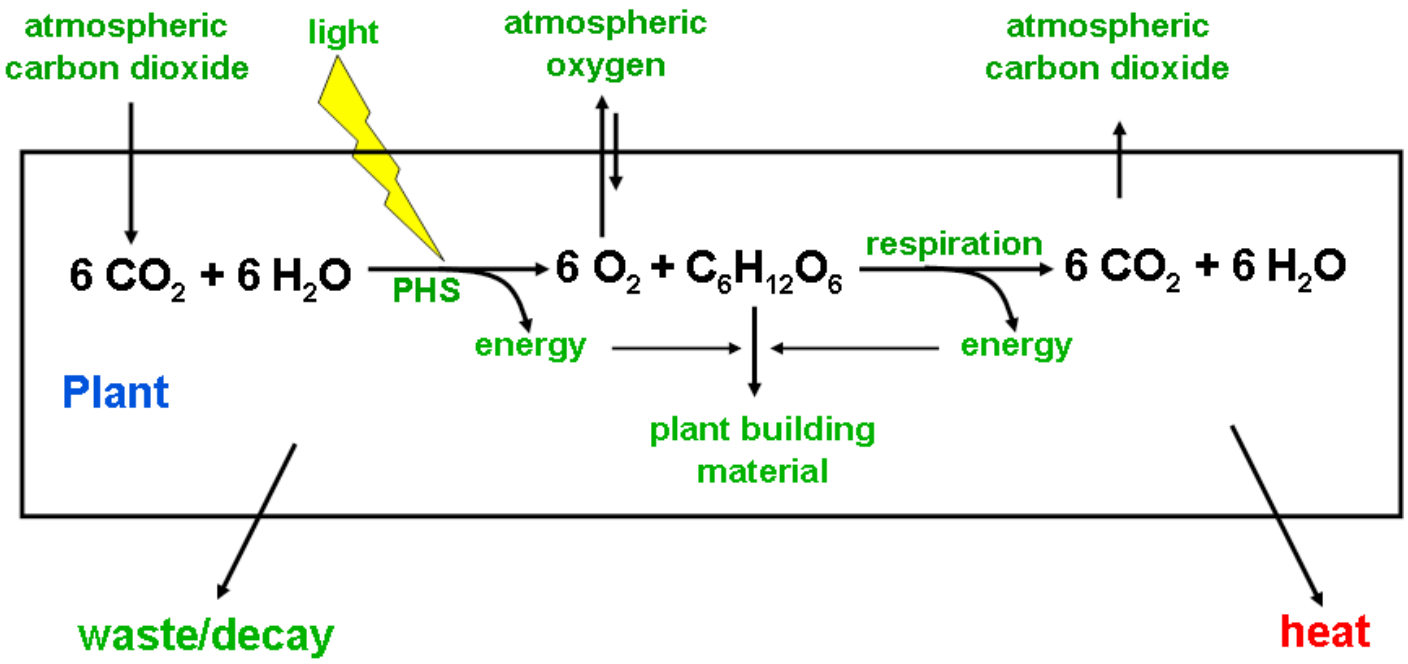
Food Assimilation and Energy Utilization in a Photoautotrophic Organism (e.g. a plant)



A photoautotrophic organism obtains its source of energy from light. Plants are photoautotrophic organisms.

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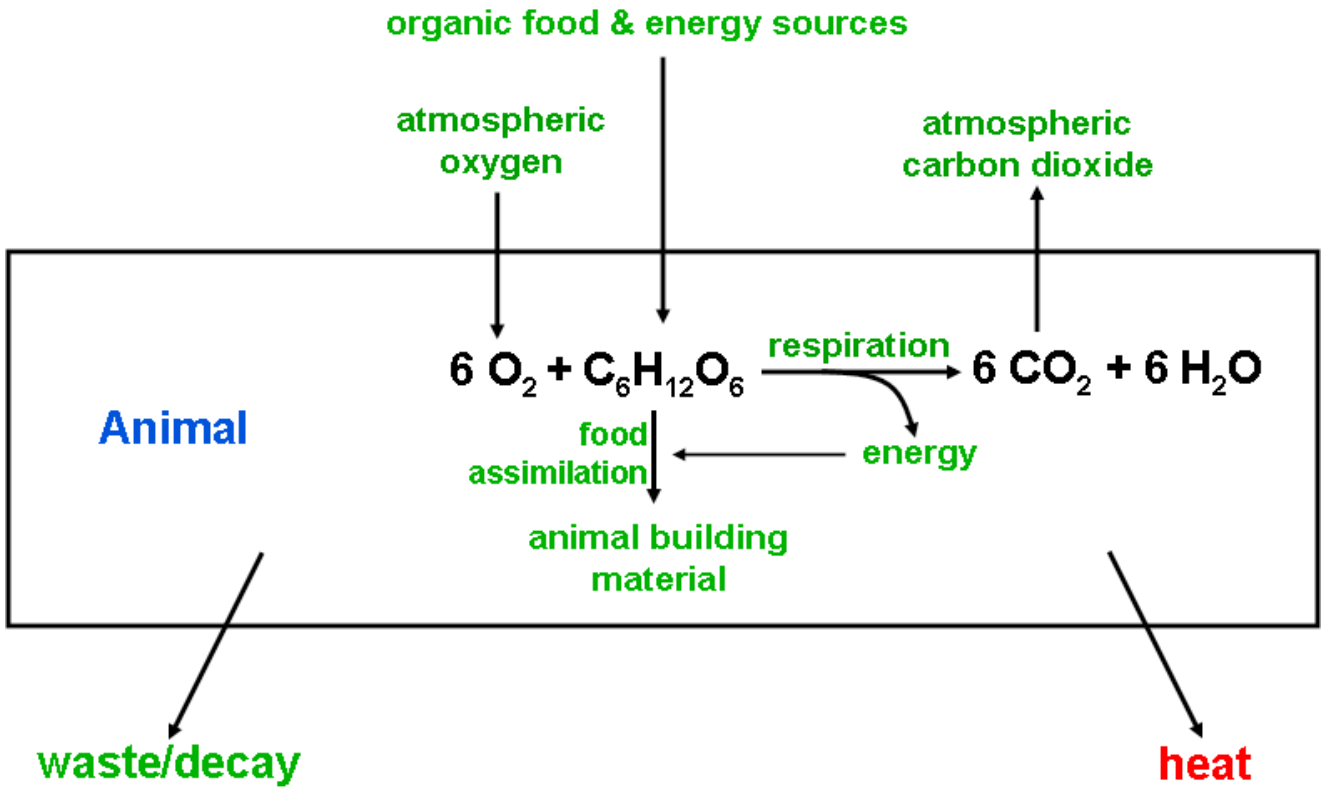
Food Assimilation and Energy Utilization in a Heterotrophic Organism (e.g. an animal)



A heterotrophic organism obtains its source of energy from organic compounds such as hexose. Animals are heterotrophic organisms.

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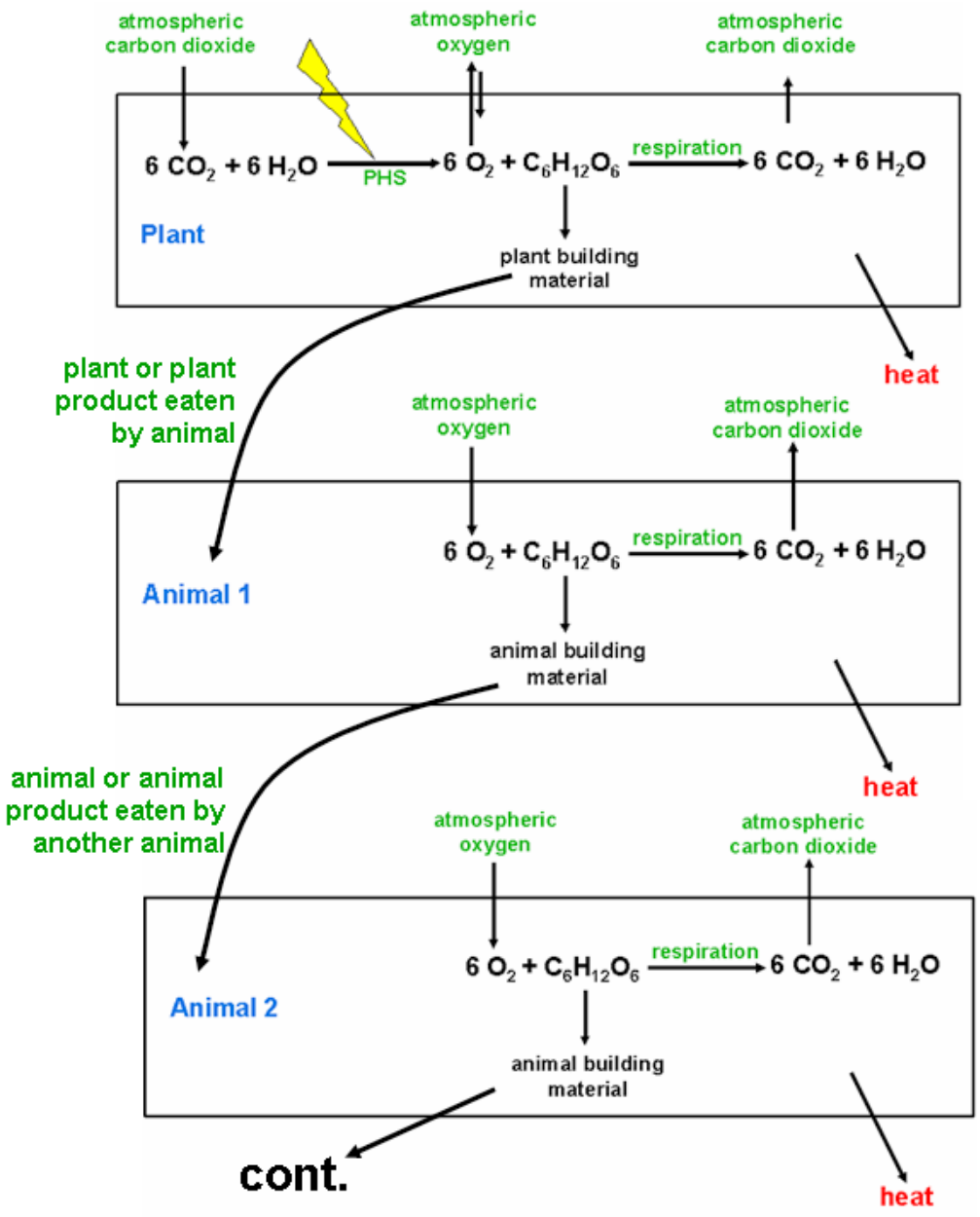
Operation of the Food Chain (Metabolic Perspective)



Progressive energy loss

Direction of food chain

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