

The background of the slide is a solid green color with a pattern of stylized, overlapping green leaves. The leaves are rendered in various shades of green, creating a sense of depth and texture. The central text is white with a subtle drop shadow, making it stand out against the green background.

Cellular Energy

Objectives

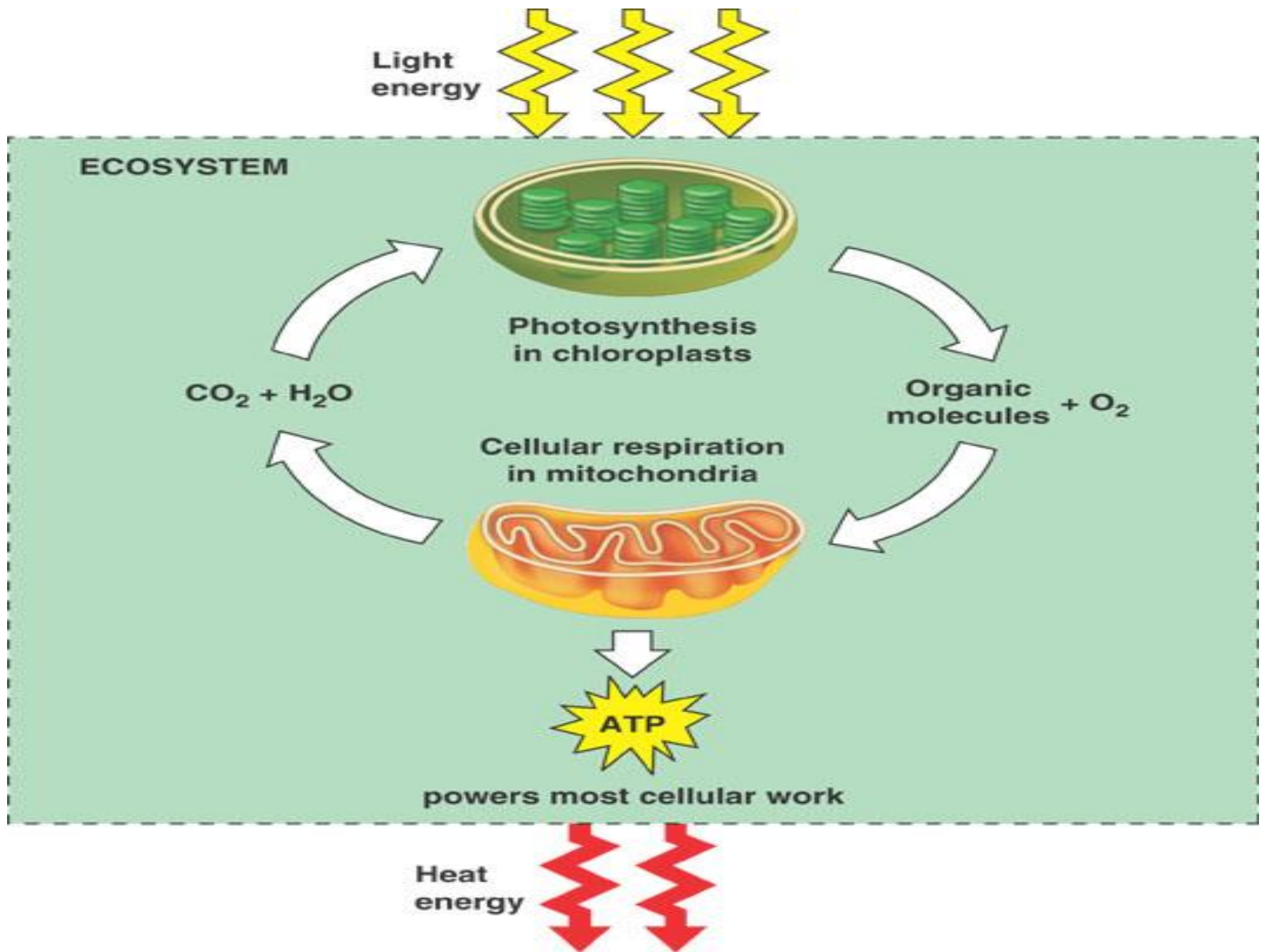
- Students will review plant/ animal cells and prokaryote/eukaryote
- Students will draw and label a diagram of the cell energy cycles.
- Students will compare and contrast autotrophs and heterotrophs
- Students will explore photosynthesis and cellular respiration

**Today you need: your notebook,
pen or pencil , textbook, worksheet**

- **Bellwork: (look up these words)**
- 1. photosynthesis (R66)
- 2. cellular respiration (R47)
- 3. chloroplast (R48)
- 4. mitochondrion (R62)
- 5. ATP(adenosine triphosphate)(R42)

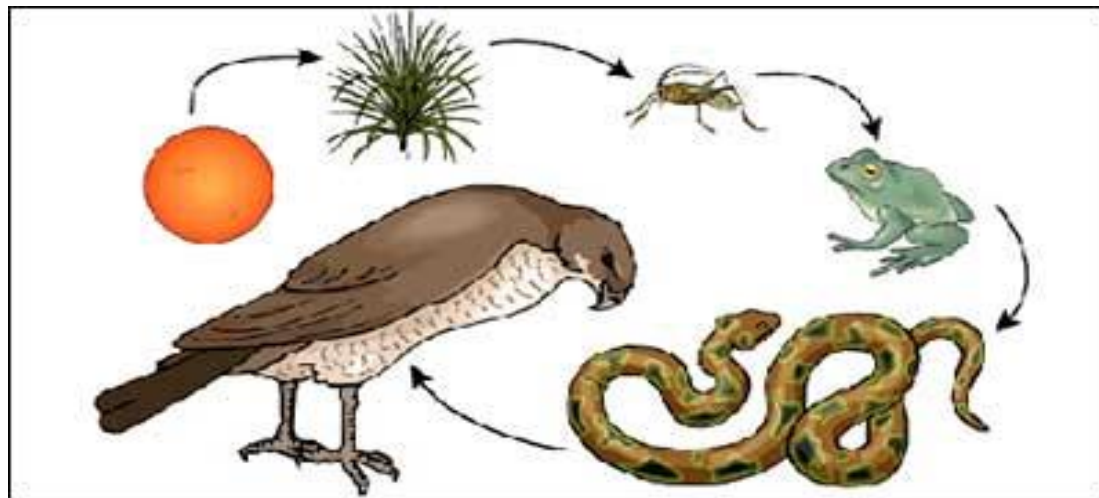
- Draw and label the diagram on the next slide.

(add a leaf around the chloroplast and an person around the mitochondria)



All energy starts with the sun!

- Life on Earth is almost entirely solar-powered with nearly **all organisms depending ultimately on food made by photosynthesis**, which uses energy from sunlight. This is **radiant** energy



Most of the the earth is under the ocean.

- How does this process work underwater?



Algae & phytoplankton

Generalised Energy Pyramid

Four trophic levels are shown

The relative biomass is shown for each level

An ecological efficiency of 10% is assumed for each level

Second Order Carnivores 1 unit

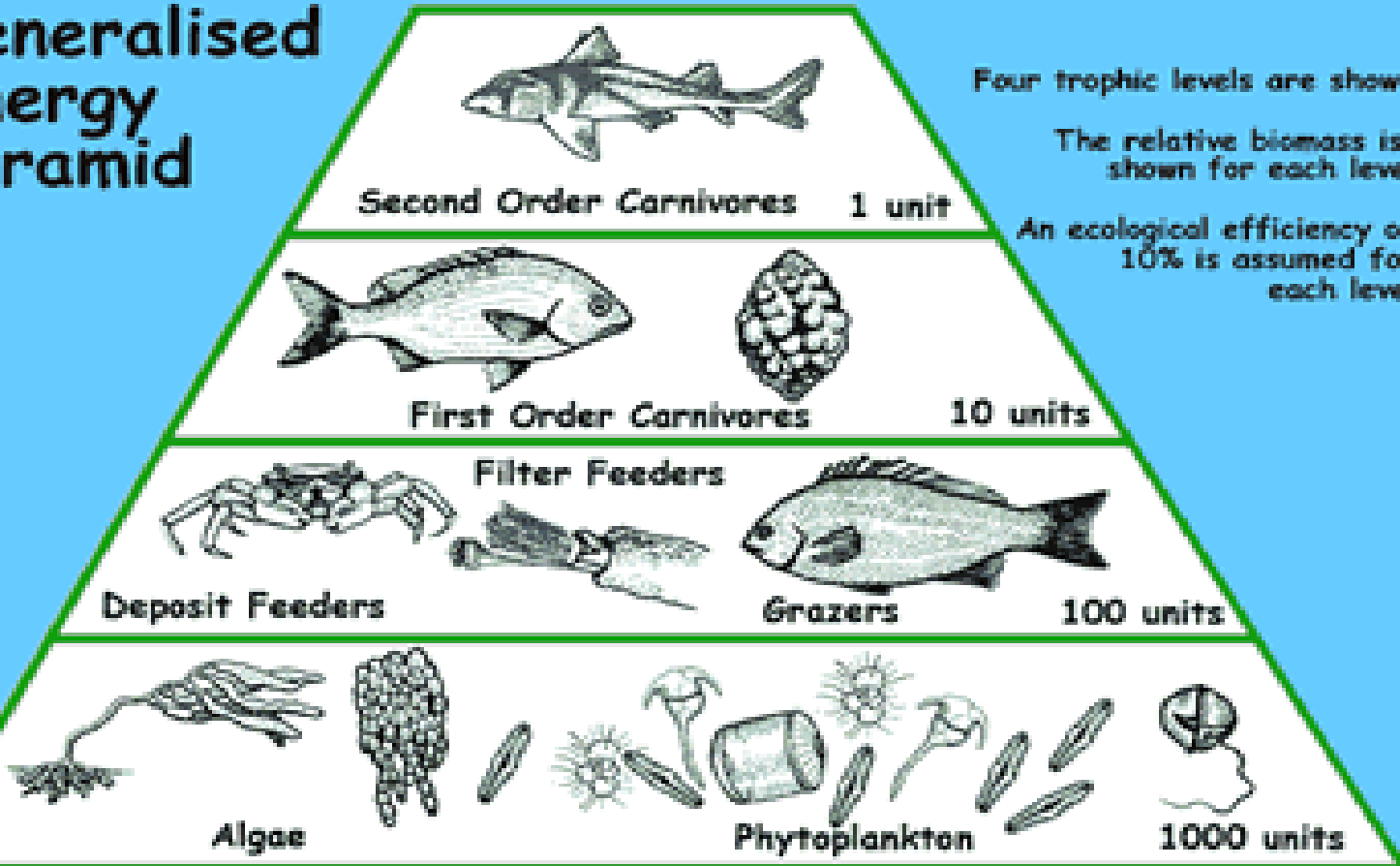
First Order Carnivores 10 units

Filter Feeders
Deposit Feeders Grazers 100 units

Algae

Phytoplankton

1000 units



Comparing sources of cell energy

- Autotrophs

- (plants & algae)
(producers)

*Make own food
from sun*

- Photosynthesis in
chloroplasts
- (Cellular respiration
in mitochondria)

- Heterotrophs

- (all other living
things)
- (consumers)
- *Eat others
(autotrophs and
other heterotrophs)*
- Cellular respiration
in mitochondria

Worksheet:

- **“Autotroph or Heterotroph”**
- **Do not write on the worksheet**
- **Number 1-31 in your notebook**
- **answer with A Or H**

Photosynthesis

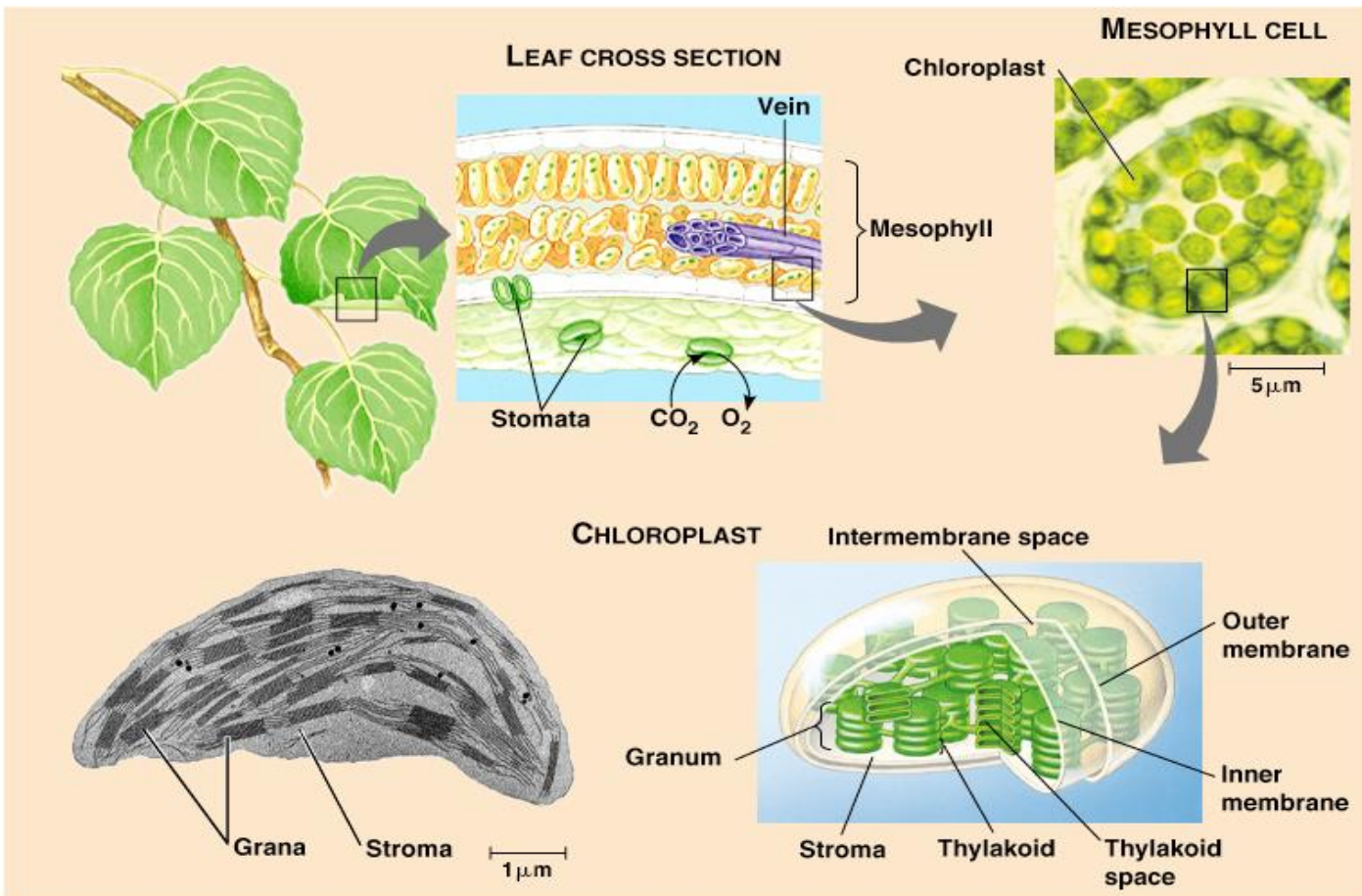
- Method of converting sun energy into chemical energy usable by cells
 - **Photoautotrophs: use light**
 - **Chemoautotrophs: use chemicals**
- (in places where it is too dark)**

Photosynthesis

Photosynthesis takes place
inside **chloroplasts** in **plant**
leaves

Chlorophyll (pigment) in
chloroplasts gives green color

chloroplasts



Energy conversion

Photosynthesis

- This takes the radiant energy of the sun and converts it to chemical energy stored in the plants as carbohydrates (glucose)

Cellular Respiration

- Transformation of chemical energy in food
- into chemical energy cells can use: ATP
- **Overall Reaction:**

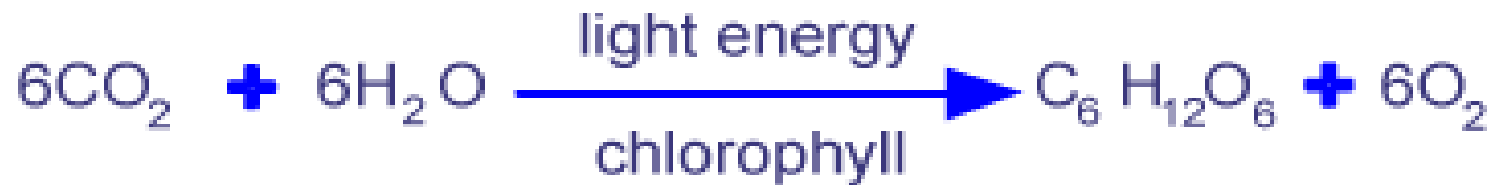


**Sugar + oxygen ---> carbon + water + energy
dioxide**

2 kinds of Cellular Respiration

- Anaerobic (no oxygen) cellular respiration (aka fermentation)
Yields 2 ATPs
- Aerobic (with oxygen) cellular respiration
Yields 36 ATPs

Photosynthesis



CARBON + WATER ----> **SUGARS + OXYGEN**
DIOXIDE

At what level to
photosynthesis and cellular
respiration take place?

How are these systems are
similar at other levels in
Biology?

Why do plants have mitochondria & chloroplasts?

- *Making 2 kinds of energy:*
- Mitochondria – make ATP for cell processes
- Chloroplasts – make energy to store as food for heterotrophs to eat

You need:
notebook, pen or pencil, 4 colored markers, Measuring Up workbook

- **Bell work – Read 40 and 41 in measuring up**
- **Answer 1-4 on 41**

Drawing

- The power of Green
- Copy the picture on the board...
- What process does it show?
- What do the faces (happy and sad) represent?
- Where does the energy for this process come from?
- What else enters and exits the formula?

worksheets

- 1. Photosynthesis or Cellular Respiration
- 2. Comparing Photosynthesis & Cellular Respiration
- 3. Autotroph or heterotroph?

Academic Vocabulary

- Terms:
- Cellular respiration
- Photosynthesis

- (form on the c drive)

Text book work

- Page 103 – questions 1,2,3,4,5
- Page 113 – questions 3 & 5
- Page 125 – 7,8,9
- Page 126 – 23, 24, 25

- If you can't answer this using your notes (what we covered together)..Find the answers in the book!!!

EOC Coach workbook

- Answer questions 1-4 on page 26

Have students copy from doc below:

- Elodea snail virtual lab document

Discuss the lab

- What part do each play?
 - Elodea
 - Snails
- What can they be compared to on land?
- What gases does each take in and give off?
- How does light affect the results?

You need: notebook, pen or pencil

- Bell Work:
- Take a look at the diagram you drew yesterday. Write one sentence that summarizes what the circle shows.
- Do your best....

“End of the World”

<http://www.youtube.com/watch?v=LWZSDi1TV8Y>

- Watch the short video about a possible end of the world scenario.
- Write at least 3 full sentences describing what happens to the Earth in the video. (You may want to jot down some notes as you watch)
- Then write at least 3 more explaining the negative effects it would have on PEOPLE.

Some answers:

- 4 across – PHOSPHATE
- 6 down – HERBIVORE
- 10 down – SIX
- (reactants -> products/waste)
- Photosynthesis
- Carbon dioxide + water -> oxygen + sugar
- Cellular Respiration:
- Oxygen + sugar -> carbon dioxide + water +atp

Do not screw around when you get here!

You need: notebook, pen or pencil, both worksheets, ruler

- **Bellwork:**
- **Copy the short worksheet into your notebook**
- **Leave room for answers**
- **Return the worksheet after class.**
- **I am not interested in your version of why I got a bad report from the sub!**

Essay – show me you get it...

- Write about what the lab showed.
- I want you to explain how the levels of CO_2 were effected by light, snails and elodea and why. What indicated the change.
- I want to hear about the reactants (go into a chemical equation) & product (come out of a chemical reaction) of photosynthesis and cellular respiration)

You need: textbook, notebook, pen or pencil, worksheet

- Bell work:
- Complete the back side (not the crossword puzzle) of the worksheet in your notebook.
- Do not write on the worksheet.
- You can work with someone who sits next to you (do not change seats!)

**You need: notebook, worksheet,
pen or pencil, textbook**

● **Bell Work:**

- Do the worksheet in your notebook (for the first 17 write P or CR)...we will go over it together...



Today you need:

textbook, notebook pen or pencil,
coach workbook, 4 colored
markers

● Bell work:

● 1. Read the first page and $\frac{1}{2}$
(98-99) in textbook

● 2. Write in your own words
what **ATP** is.