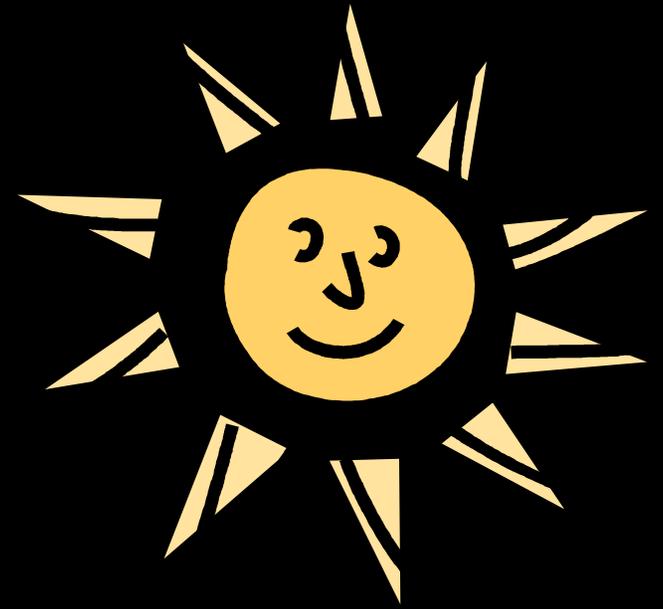


Chapter 8-1

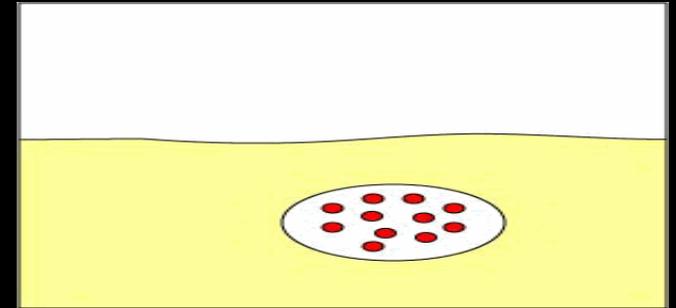


1. Energy for life

A. Every organism requires energy (E) for biological work.

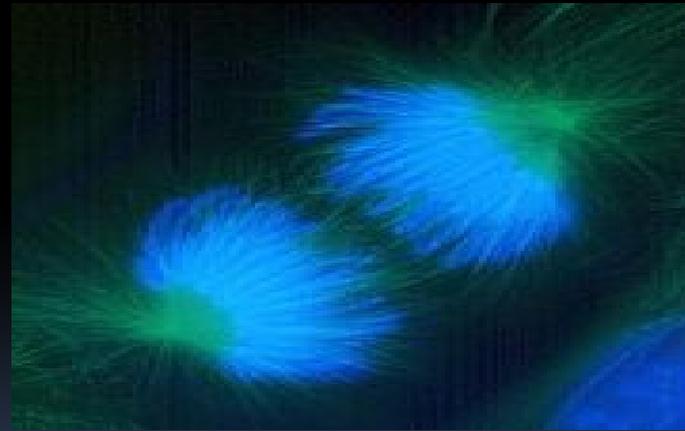
B. Biological Work Includes:

1. Active transport



2. Photosynthesis

3. Mitosis



4. Protein Synthesis (making proteins)

C. Energy Comes From Food



1. Autotrophs (producers) Ex. _____
produce their own glucose/food.

a. by the process photosynthesis (PS)

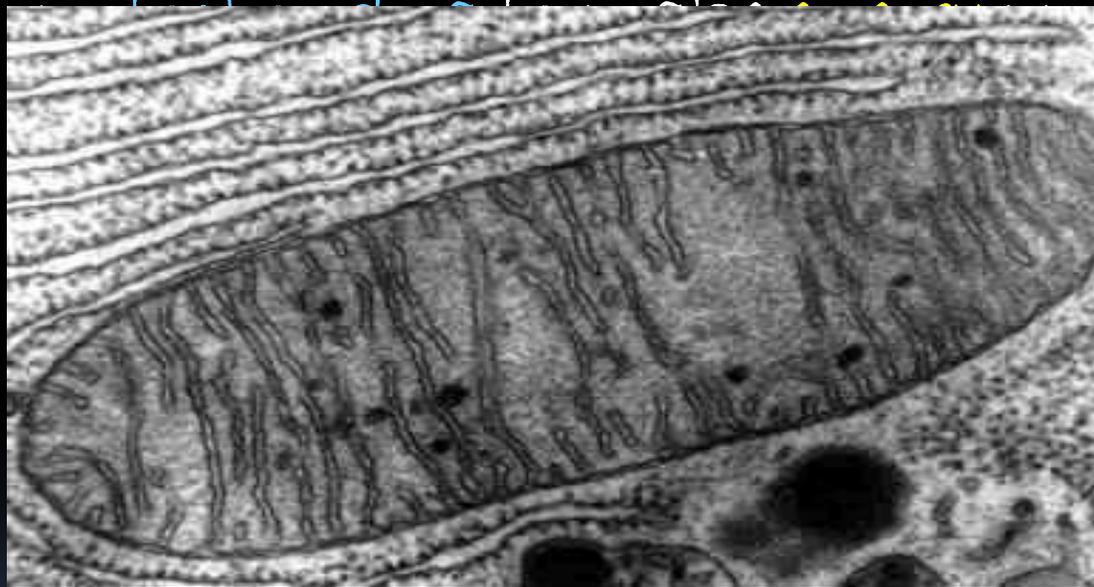
b. **Energy** for making glucose comes
from

the sun (ultimate source of **E** for all
organisms)



2. **Heterotroph** (consumers) Organisms that cannot produce their own food.

a. Glucose is broken down in



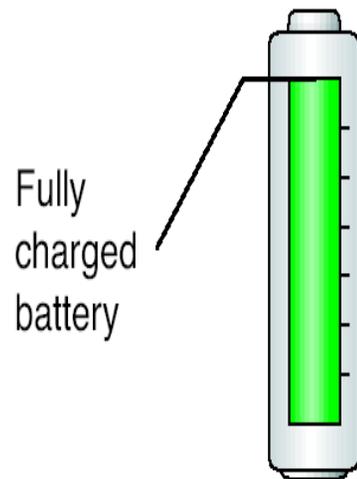
molecule

b. Cellular Respiration (CR) = process of breaking down glucose to make **ATP**

D. ATP-Adenosine Triphosphate

1. Can be compared to a
(fully charged battery)

Adenosine Triphosphate (ATP)

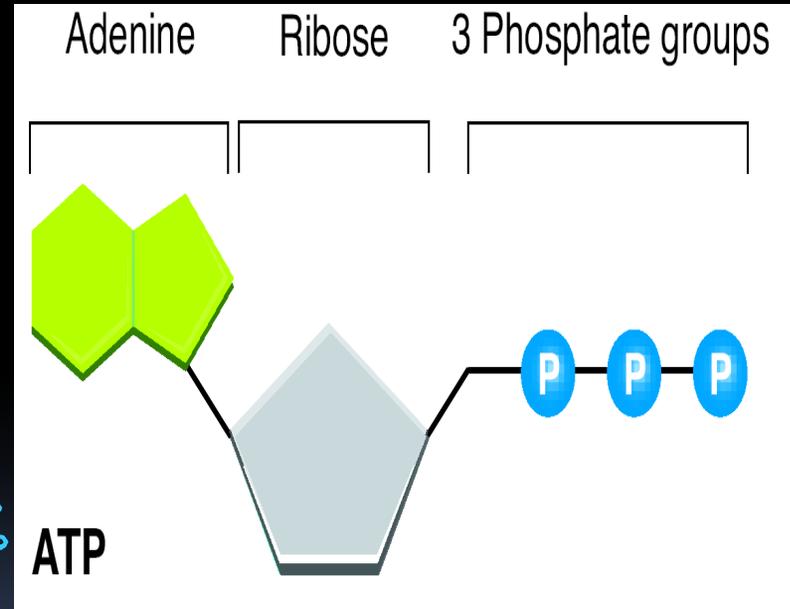


2. Composed of 3 parts:

a. adenine (amino acid)

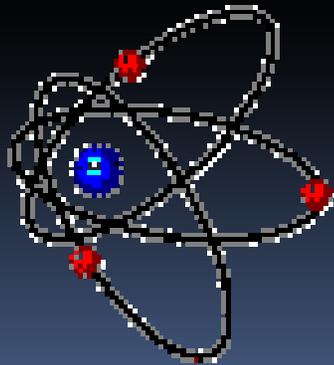
b. ribose (sugar)

c. 3 Phosphate groups

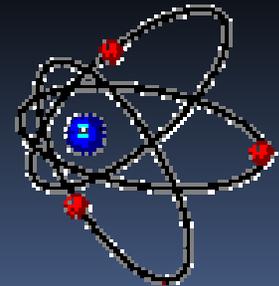


3. Energy is in the phosphate
BONDS of the ATP molecule

What forms the bond?



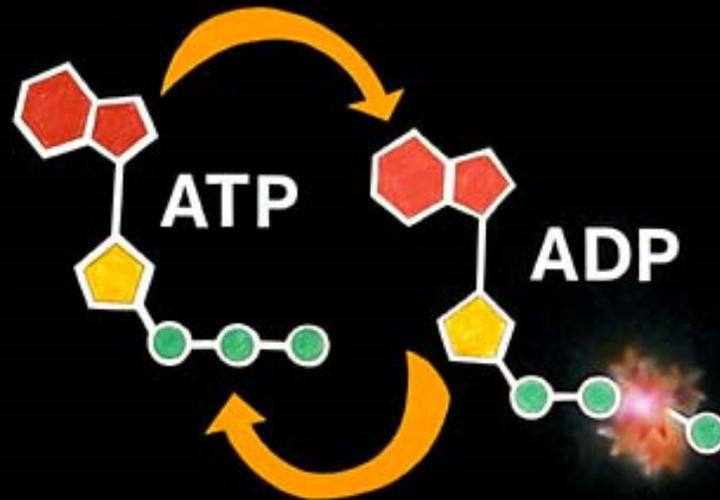
ELECTRONS



E. When a phosphate bond is broken:

1. Energy is released

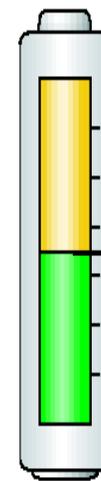
2. ADP is produced



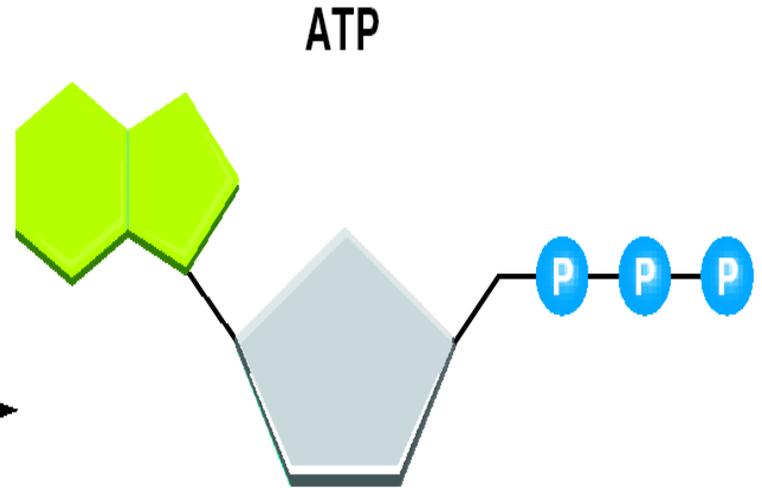
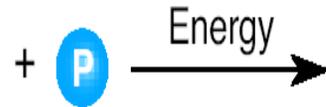
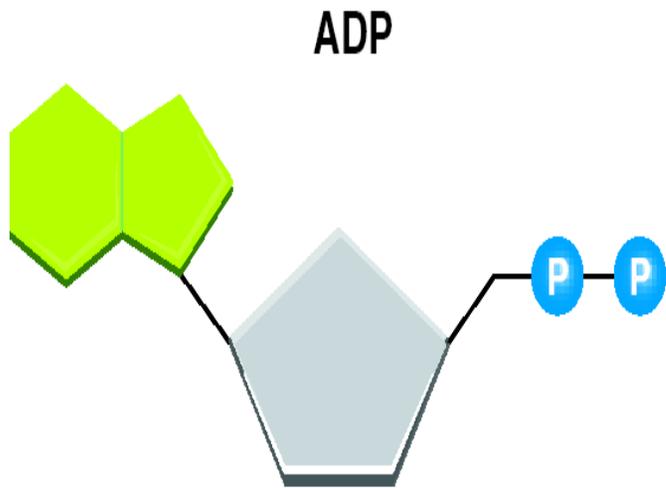
F. ADP-Adenosine Diphosphate

1. Differs from ATP b/c only 2 phosphates
2. Can be compared to a Low charged battery

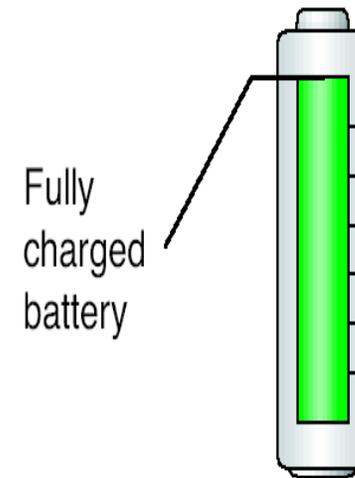
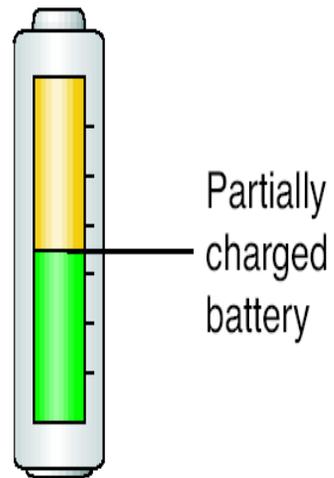
Adenosine Diphosphate (ADP) + Phosphate



Partially
charged
battery

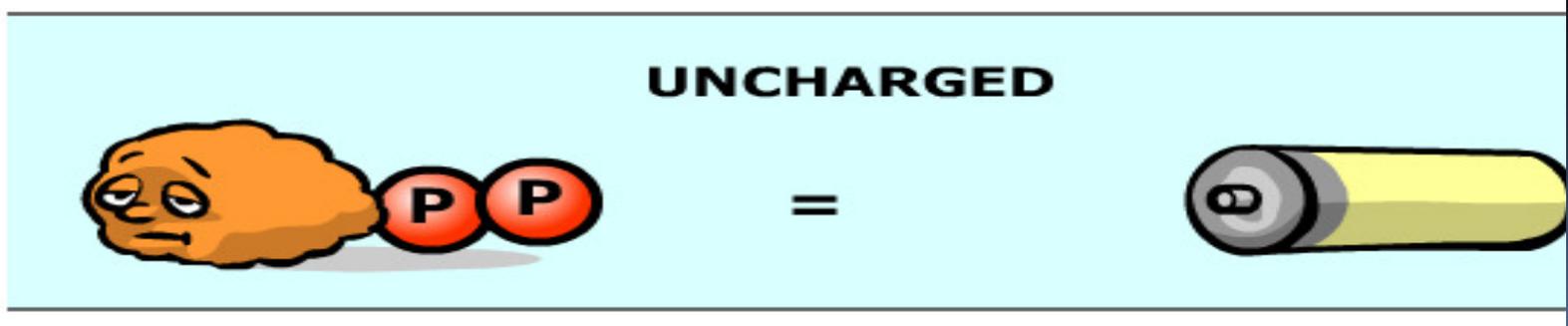
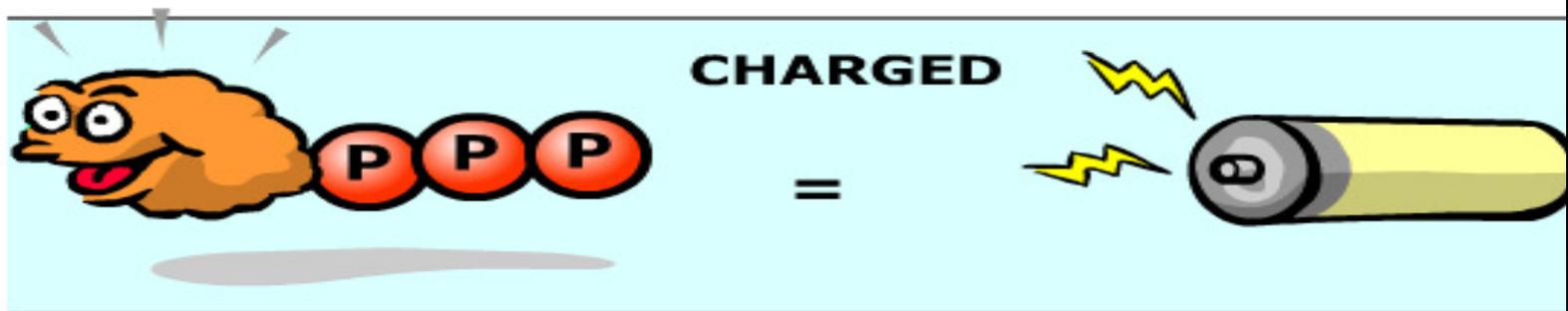


Adenosine Diphosphate (ADP) + Phosphate $\xrightarrow{\text{Energy}}$ Adenosine Triphosphate (ATP)



3. ADP can be recharged back to ATP by adding back the 3rd phosphate (P)

ATP, YOUR "RECHARGEABLE BATTERY"



Q. ATP is the ONLY useable energy molecule in the cell

1. ALL food energy must be converted to ATP!!!!!!

2. GLUCOSE is the most easily converted.

H. FUN FACT 😊

1. Your body uses 1 billion
ATP per minute.

2. To meet this you should consume
approx. 1800-2500 calories
everyday.

3. Different foods have different
amounts of energy

1. Which organic compound do you think has the **most energy** per gram?

1. **Carbohydrates** = 4 cal/gram

2. **Proteins** = 4 cal/gram

3. **Fat** = 9 cal/gram

4. How many calories/gram does water have?

No calories!