

### FOODS: Make. Take. Break.

**PHOTOSYNTHESIS = Make** 

**ANIMAL NUTRITION = Take** 

**CELLULAR RESPIRATION = Break** 



### **PHOTO-SYNTHESIS**

#### **STARTING WITH:**

WHAT WE LEARNED IN GRADES 8 & 10 -

AND THEN: UPGRADING TO GRADE 11.



**LEAF STRUCTURE** 







# SOME DETAILS

- Leaves are green because of their chlorophyll.
- Water comes from the soil, through roots, up stem, through the petiole into the midrib, then the veins.
- Each vein ends in a little hole (stoma) through which some of the water evaporates.
- The remaining water is used in photosynthesis.
- Carbon dioxide comes in from the air through the stoma. The food is now made.
- Oxygen goes out into the air through the stoma.
- Food is sent to where it is needed in the plant.



## Photosynthesis

# **PHOTOSYNTHESIS EQUATION**

 <u>Chlorophyll</u> in the leaf makes food out of water and carbon dioxide. It then puts the sun's energy into that food. It simply breaks its two ingredients down into its chemicals, and then rearranges these chemicals to make food (called glucose). Some Oxygen is <u>not</u> needed.



\* COO HHO 7

\*

#### But:

In <u>Grade 11</u> we learn that the chemical formula for Glucose is actually: C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>



NO PROBLEM !!!

The <u>principle</u> remains <u>exactly the same</u>. Just multiply both sides of the equation by 6:

 $6^* + 6CO_2 + 6H_2O \rightarrow C_6H_{12}^*O_6 + 6O_2$ 



# **THE PROCESS**

#### This all happens inside the chloroplast.

Its Membranes are permeable to all products and requirements for photosynthesis.

Its Stroma is its jelly-like plasmic medium. This contains enzymes, ribosomes, starch grains.



Outer

Inner membrane Stroma





### Chloroplast diagram