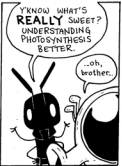


# Photosynthesis OR "gimme Some Sugar"

STARRING  
WILBUR &  
ANT EDNA



WHAT DO YOU MEAN "PASS?"



I MEAN, I'M NOT INTERESTED IN HOW PHOTOS ARE SYNTHESIZED. I DON'T EVEN HAVE A CAMERA.

I'M NOT TALKING ABOUT DEVELOPING PICTURES! I'M TALKING ABOUT THE PROCESS THAT TRAPS A TINY PACKET OF THE SUN'S ENERGY IN THE LIFE-SUSTAINING MOLECULE OF GLUCOSE THAT MAKES OUR VERY EXISTENCE POSSIBLE.



YOU'RE PULLING MY LEG.

NO. I'M TOTALLY SERIOUS.

uh... YOU ARE PULLING ON MY LEG.

oh

sorry

JUST LET ME EXPLAIN IT TO YOU.

PLEASE?

I FANCY MYSELF A BIT OF AN EXPERT.



fine

BRILLIANT! FIRST, LET'S CONSIDER THIS CHART.

YOU HAVE A CHART?

HOW ELSE WOULD I EXPLAIN IT?



REACTANTS



Photosynthesis!

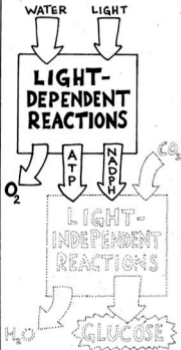


PRODUCTS

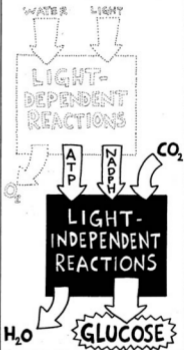
NOW, AS YOU CAN SEE, WATER, LIGHT AND CARBON DIOXIDE GO INTO THE PHOTOSYNTHETIC PROCESS AND OXYGEN, WATER, AND GLUCOSE COME OUT.

PHOTOSYNTHESIS IS COMPOSED OF TWO SEPARATE SETS OF CHEMICAL REACTIONS: THE LIGHT-DEPENDENT REACTIONS AND THE LIGHT-INDEPENDENT REACTIONS.

THE LIGHT-DEPENDENT REACTIONS USE WATER AND ENERGY FROM A PHOTON OF LIGHT TO BUILD THE MOLECULES ATP AND NADPH. OXYGEN IS RELEASED AS WASTE. ATP AND NADPH ARE USED AS FUEL FOR THE LIGHT-INDEPENDENT REACTIONS.



THE LIGHT-INDEPENDENT REACTIONS DO NOT REQUIRE LIGHT DIRECTLY. IN THESE REACTIONS, CARBON DIOXIDE IS PULLED FROM THE AIR AND ATTACHED TO AN EXISTING MOLECULE. THEN THE ATP AND NADPH ARE USED TO TURN THAT MOLECULES INTO GLUCOSE.



IMPRESSIVE, HUH?



YEAH. MOST ANTS DON'T HAVE CHARTS



SO, HOW DO PLANTS CATCH A PHOTON OF LIGHT?



DO THEY USE A CAGE OR DIG A DEEP HOLE AND COVER IT WITH LEAVES!

uh... NO AND NO.



LET ME SHOW YOU.

IMAGINE THAT THIS PEBBLE IS A PHOTON OF LIGHT AND YOU ARE A LEAF.

OK.



I HOPE THIS WORKS.



C'MON, C'MON.



YES!



NOW WHERE WERE WE?

WHAT ARE YOU DOING HERE?  
**I'M DREAMING!**



YOU CAN SAY THAT AGAIN, D'WEBB!

whoop!

HUMPH!



-sigh-

IT'S BETTER THIS WAY. NOW WE CAN FOCUS ON PHOTOSYNTHESIS!





HEY!  
YOU HIT ME  
WITH A  
ROCK!



I HAD TO GET YOU DREAMING IF WE'RE GOING TO  
EXPLORE A PLANT CELL, DIDN'T I? IT'S NOT LIKE  
I HAVE A SHRINK RAY OR SOMETHING.

PLUS,  
THIS WAY I  
GET TO  
FLY.



CHLOROPLAST

AS YOU KNOW,  
PLANTS ARE COMPOSED  
OF SMALL FLUID-FILLED BAGS  
CALLED CELLS.

INSIDE THE CELLS ARE  
EVEN SMALLER, FLUID-FILLED  
BAGS CALLED ORGANELLES.

PHOTOSYNTHESIS OCCURS  
IN ORGANELLES CALLED  
CHLOROPLASTS.

THE PLANT CELL

NOW, WHY DON'T YOU  
KARATE CHOP THIS CHLORO-  
PLAST IN HALF.

COOL  
BEANS!

CHLOROPLAST

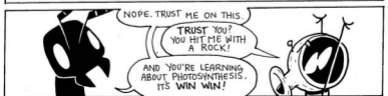
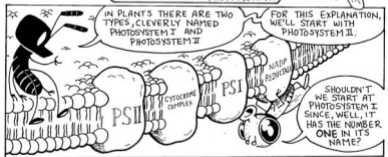
CHLOROPLASTS CONTAIN STILL  
SMALLER FLUID-FILLED DISKS  
CALLED THYLAKOIDS.

KI-  
YAH!

THE THYLAKOIDS ARE  
ARRANGED IN STACKS  
CALLED GRANA.  
(a single stack of thylakoids  
is called a GRANUM)

THIS IS  
WHERE LIGHT  
IS ABSORBED FOR  
PHOTOSYNTHESIS.





THE PHOTOSYSTEM HAS TWO MAJOR REGIONS. THE LARGE ANTENNA COMPLEX SURROUNDS THE SMALLER REACTION CENTER. ENERGY FROM A PHOTON OF LIGHT IS ABSORBED BY THE CHLOROPHYLL IN THE ANTENNA COMPLEX AND FUNNELED TO THE REACTION CENTER.

IMAGINE I'M A CHLOROPHYLL MOLECULE AND YOU ARE A SPECIAL PAIR OF MOLECULES IN THE REACTION CENTER CALLED P680.

