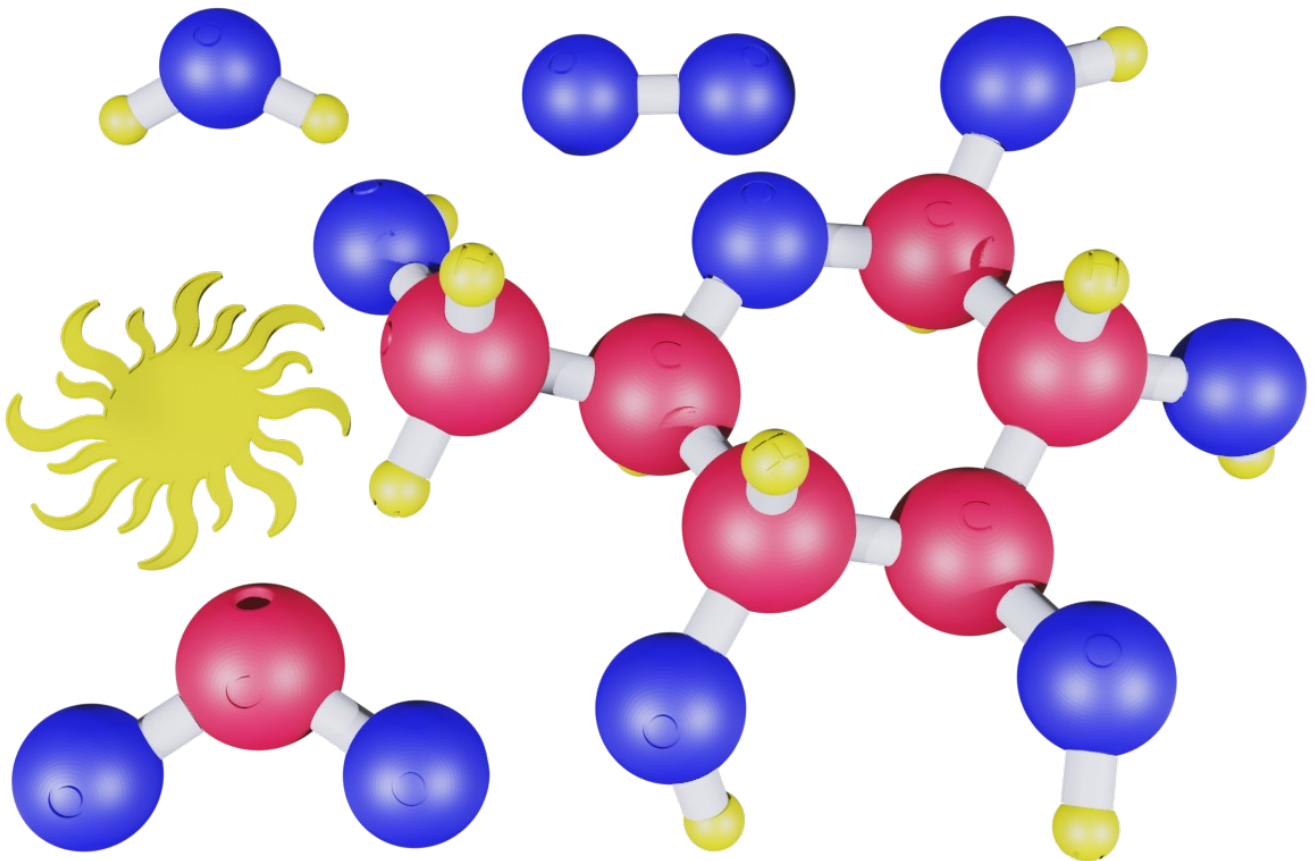


Photosynthesis



Student sheet

Educational resources



www.anhelsnatura.com

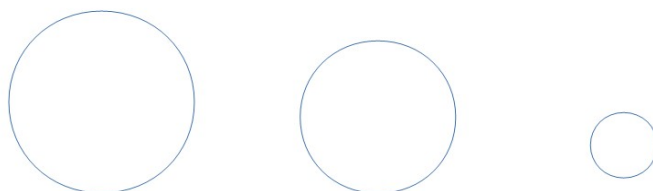
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We place all the pieces on the table and group the like ones.

- How many different pieces do we have? _____

First, we observe that we have 3 types of "balls" that represent the atoms of the different chemical elements that participate in photosynthesis as part of molecules.

- We observe the balls and copy the letter engraved on each one:



- What do we think these letters mean?

- We find all the chemical elements on the periodic table. We look for the letters on each ball and circle them.

Group →	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
↓ Period	1 1 H																	2 He
2	3 Li	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne
3	11 Na	12 Mg											13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
4	19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
5	37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
6	55 Cs	56 Ba		72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
7	87 Fr	88 Ra		104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Nh	114 Fl	115 Mc	116 Lv	117 Ts	118 Og
Lanthanides			57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu	
Actinides			89 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr	

- Using the internet, we find out which chemical element each symbol corresponds to.

C: _____ O: _____ H: _____

Now we know what the "balls" are. And the remaining piece? Perhaps we've guessed that it's used to join the "balls." We'll call this other piece a chemical bond, or, to simplify, a bond.

- What do atoms form when they join together? _____

- We notice that there are holes in the balls; how many bonds do we think the carbon atom can form? Why? And oxygen? And hydrogen?

C: _____

O: _____ H: _____



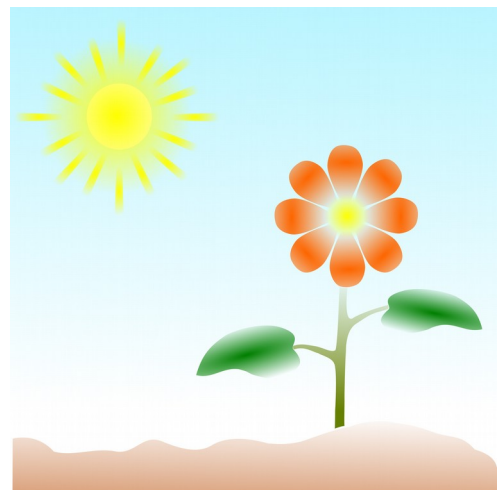
- We observe the photosynthesis reaction. To start photosynthesis, the plant needs: water (H_2O), carbon dioxide (CO_2), and energy. We indicate with arrows in the drawing where it gets it.



H_2O

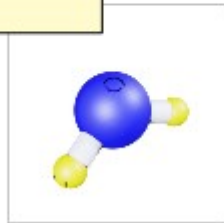
CO_2

E

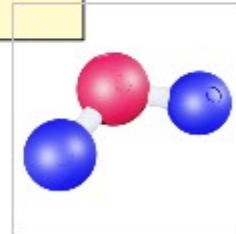


Next, we assemble the molecules needed to start photosynthesis using the atoms and bonds:

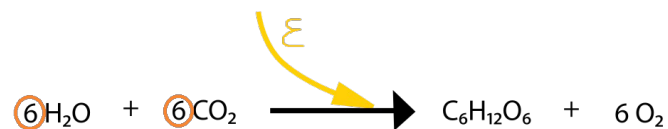
The water molecule is made up of 2 hydrogen atoms bonded to an oxygen atom



Carbon dioxide is made up of two oxygen atoms bonded to one carbon atom.

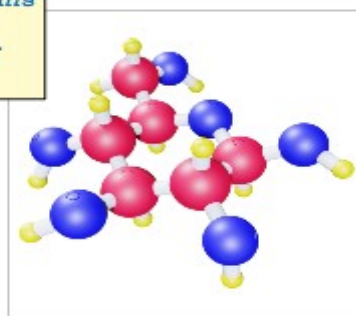


● We observe the photosynthesis reaction: how many water molecules do we need?___ And carbon dioxide?___ We assemble them all.

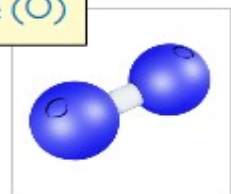


Now we disassemble them, break the bonds, and build the molecules that are the product of the reaction: six oxygen molecules (O_2) and one glucose molecule ($\text{C}_6\text{H}_{12}\text{O}_6$). We observe that we must exert an effort to do this work and that the number of atoms remains constant (no more, no less).

The glucose molecule is made up of 6 carbon atoms, 12 hydrogen atoms and 6 oxygen atoms.

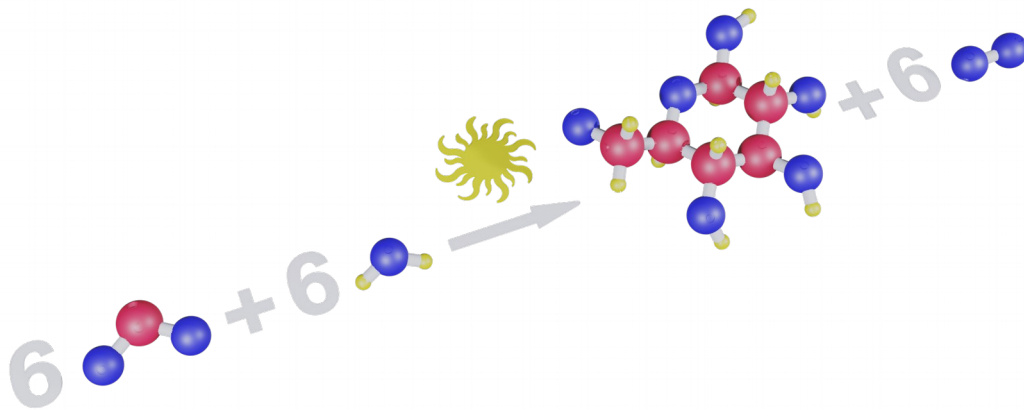


The oxygen molecule is made up of 2 atoms of the same element (O)



● Where do we get the energy to do this? _____
What type of energy is it? _____ Like us, plants need energy
to break and form bonds; where do plants get that energy?
_____ What type of energy is it? _____.

Using all the elements of the product (numbers, arrow, sun...), we
"assemble" the entire photosynthesis reaction.



● What importance do we give to this process?
