Cell Energy

Organisms that are able to use a source of energy to produce food directly are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Organisms that obtain energy from the foods they eat are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Colored substances that absorb or reflect light are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The principal pigment of green plants is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. A cluster of pigments is known as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Write the equation for photosynthesis:

*What happens when a green plant absorbs sunlight*? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are raised to a higher energy level and are trapped in chemical \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in 2 ways:

1. A pair of high-energy electrons is passed directly to an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that can accept a pair of high-energy electrons and later transfer them along with most of their \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to another compound. Plants use an electron carrier called \_\_\_\_\_\_\_\_\_. When NADP+ accepts a pair of high-energy electrons, it is converted to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_& Energy is trapped.
2. Energy is stored as bonds between \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_groups. \_\_\_\_\_\_\_\_is composed of a \_\_\_\_\_\_\_carbon sugar (ribose) and \_\_\_\_\_\_\_\_\_\_\_\_phosphate groups..

How is the energy stored in these molecules released? Simply by\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

PHOTOSYTHESIS: takes place in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Light reaction: takes place within \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that contain \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: light energy absorbed by photosystem pigment; \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_passed from 1 pigment molecule to the next until it reaches a special pair of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ molecules in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_; high energy electrons are released & passed to electron carriers. Although all photosystem pigments can absorb light, only a special pair of chlorophyll molecules can process it.
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: upon their release from the reaction center, high energy are transferred along a series of electron carriers. At the end of the electron transport chain, the high energy electrons are passed to the electrons carrier \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, converting it to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: Electrons are taken from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_to replace the ones that wound up in NADPH. \_\_\_\_\_\_\_\_ electrons are removed from \_\_\_\_water molecules , leaving \_\_\_\_\_ hydrogen ions and \_\_\_\_\_\_oxygen atoms. The \_\_\_\_\_\_\_oxygen atoms from a single molecule of \_\_\_\_\_\_\_\_\_\_\_\_\_that leaves the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and is eventually released into the \_\_\_\_\_\_\_\_\_.
4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ions left behind when \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is split are released inside the photosynthetic membrane. In addition, as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_are passed from \_\_\_\_\_\_\_\_\_\_\_\_\_\_to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, more H+ are pumped across the membrane. After a while, the inside becomes \_\_\_\_\_\_\_\_\_ and the outside \_\_\_\_\_\_\_. The difference in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a source of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. An enzyme makes use of this energy and attaches a phosphate molecule to ADP to form \_\_\_\_\_\_\_\_\_\_\_\_.

Dark Reactions: aka Calvin Cycle - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_is not necessary but most of the time is present.

\_\_\_\_\_\_ Carbon sugar combines with \_\_\_\_\_\_\_\_\_\_to form \_\_\_\_\_\_\_3-Carbon compounds. \_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_ energy are used to convert these to \_\_\_\_\_\_\_\_\_\_\_. Most PGAL molecules are recycled for the dark reactions but \_\_\_\_ in \_\_\_\_ is used to make \_\_\_\_\_\_\_\_\_\_ or other end products. Raw materials are produced that are needed to make almost everything cells need.