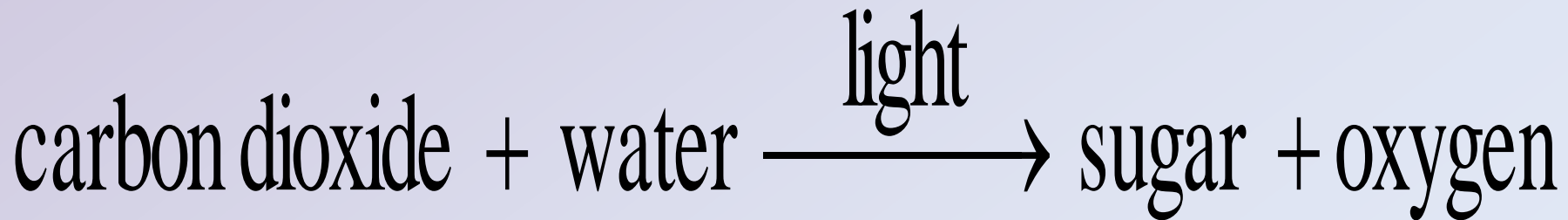
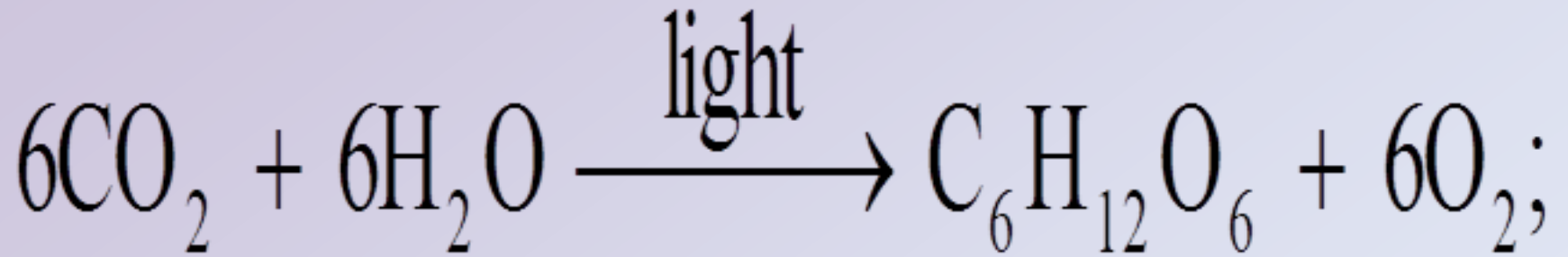


Write the overall equation for photosynthesis in both symbols and words.



What is the difference between an autotroph and a heterotroph? Give an example of each type of organism.

Autotrophs are organisms that can make their own food; one example is grass. Heterotrophs are organisms that get energy by consuming other organisms or organic matter; an example is a rabbit.

Thylakoids are arranged in  
stacks known as

---

grana

Organisms, such as hawks and  
leopards, that obtain energy  
from the foods they consume  
are called

---

Heterotrophs; consumers

During the Calvin cycle,  
molecules of

---

supply the carbon component  
of carbohydrates.

carbon dioxide

A membrane protein called

---

allows  $H^+$  ions to pass through  
the thylakoid membrane and  
into the stroma.

ATP synthase

What chemical in photosynthesis is an electron carrier molecule?

NADP<sup>+</sup>

The Calvin cycle produces  
sugars within the  
\_\_\_\_\_?

stroma



Where does the Calvin cycle  
takes place?

stroma

Energy is released from ATP  
when

a phosphate group is removed.

A \_\_\_\_\_ is a stack of  
thylakoids.

granum

What is the role of NADP<sup>+</sup> in photosynthesis?

electron carrier

H<sup>+</sup> ions are released as water splits contributes to the inside of the thylakoid membrane becoming positively charged during the \_\_\_\_\_ reactions?

light-dependent

ATP and NADPH are used to produce high-energy sugars in the \_\_\_\_\_ reactions.

light-independent

The Calvin cycle is another  
name for the

light-independent reactions.

What are the three parts  
of an ATP molecule?

adenine, ribose, and three phosphate groups



Plants get the energy they need  
for photosynthesis by  
absorbing

sunlight.

Organisms, such as plants, that make their own food are called

autotrophs.

Autotrophs produce  
carbohydrates during

photosynthesis

Organisms that cannot make their own food and must obtain energy from external sources are called

heterotrophs

Where do the light-dependent reactions take place?

within the thylakoid membranes

Photosynthesis uses sunlight to  
convert water and carbon  
dioxide into

oxygen and high-energy sugars

The stroma is the region  
outside the

thylakoids

What are the products of the light-dependent reactions?

ATP, NADPH, and oxygen gas



What is the product of the  
Calvin cycle?

sugars

The Calvin cycle takes place in  
the

stroma

During the \_\_\_\_\_, plants  
use the energy in ATP and  
NADPH to build high-energy  
sugars.

---

Calvin cycle  
light-independent reactions

The \_\_\_\_\_ provides cells with compounds that can store energy for more than a few minutes.

---

Calvin cycle

The six carbon atoms needed to make a molecule of glucose come from \_\_\_\_\_ in the atmosphere.

---

carbon dioxide

What is the product of the  
Calvin cycle

sugars

what provides the carbon  
needed to make sugars?

Carbon dioxide

What is the product of the light-dependent reactions?

oxygen