Honors Biology Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
NDHS Per: \_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_

**Photosynthesis**

Meaning:
 Synth = **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
 Photo =

Importance:

 (organisms that make their own food)  into  for themselves and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(organisms that eat other things).

**Equation**:

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Location: in the cells of producers
 Ex:

In plants and algae photosynthesis occurs in the .

**Chloroplast Structure:**



**Process of Photosynthesis**

Two Main Steps:

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: Light is used to **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Occurs in the

1. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**: Energy in ATP and NADPH are used to **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** Occurs in the

**Light Dependent Reaction:**

Occurs in the Thylakoid of the Chloroplast

Structure of the Thylakoid:

Thylakoid Membrane and Thylakoid space

Thylakoid Membrane Contents:

1. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**for **\_\_\_\_\_\_\_\_\_\_\_\_\_**light energy

Primary Pigment: **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

* Two forms: Chlorophyll a and Chlorophyll b – slight different in molecular structure – allows them to absorb **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of light
- Chlorophyll absorbs **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Secondary Pigments: in a lesser abundance in the thylakoid so not as apparent
- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
-  – yellow and orange pigments

All the pigments make up an  called a

 that  it into one area.

1. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
- series of that
2. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**: use the energy from electrons to **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** from the
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: an enzyme that puts electrons, hydrogen ions, and NADP+ together to
4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: An enzyme that makes

**NADP+/NADPH:**

Nicotinamide Adenine Dinucleotide Phosphate – is a

This is a  that



**ATP is**



ATP  in the Phosphate bonds when a phosphate is bound to ADP (adenosine diphosphate)



**Steps of the Light Dependent Reaction**1) In the thylakoid space,

 Oxygen diffuses out of the chloroplast and out of the leaf through the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

2) The

3) The electron passes through the  and gives energy for the transmembranal proteins to  from the

4) The electrons are at a photosystem and then pass to  where they join a hydrogen ion and NADP+ to make **\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

5) The hydrogen ions that have been pumped into the thylakoid space have built **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

The ATP and NADPH are then used in the Light Independent Reaction

**Light Independent Reaction**

Occurs in the of the chloroplast

Called the “” reaction because it , but can occur in the light.

Also known as the

**Requires:**

**Process of Light Independent Reaction**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

This occurs forming  with three carbons each. These are then joined to make  **.**

**Summary**: