**Light Reactions Flowchart Activity**

This activity’s goal is to help student work through the steps of the light reactions of photosynthesis to better understand how light energy is captured to power molecules and electrons to subsequently fix carbon in the Calvin cycle to make new organic molecules.

1. Use the following list of terms and connectors to fill in the boxes on the blank Light Reactions Flowchart, showing the movement of electrons and energy through the light reactions.

**Connectors (boxes alongside arrows)**

ENERGY (used four times)

High-energy electron (used six times)

Low-energy electron (used twice)

**Terms**

Sun

PS II light-harvesting complex pigments

P680 (special pair chlorophyll *a* pigment molecules in PS II)

Primary electron acceptor in PS II

Pq

Cytochrome complex

Pc

PS I light-harvesting complex pigment

P700 (special pair chlorophyll *a* pigment molecule in PS I)

Primary electron acceptor in PS I

H2O

2 electrons

O (oxygen)

2 H+

4 H+ (used three times)

ATP synthase

ADP

Pi

ATP

Fd

NADP+ reductase

NADPH

NADP+

H+

2. Use your flowchart to help you answer the following questions:

(a) Trace the path of electrons through PS II and PS I.

(b) Trace the path of energy through the light reactions.

(c) What is the source of energy for this process?

(d) How does the energy move through PS II and PS I?

(e) Explain how this process produces ATP.

(f) Explain how this process produces NADPH.

(g) Explain the role of water in this process.

(h) Place the steps of the process in the context of the locations in the chloroplast.