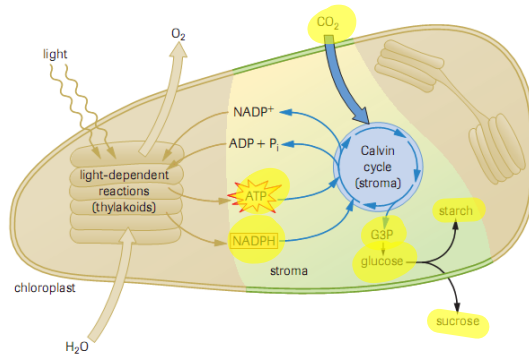


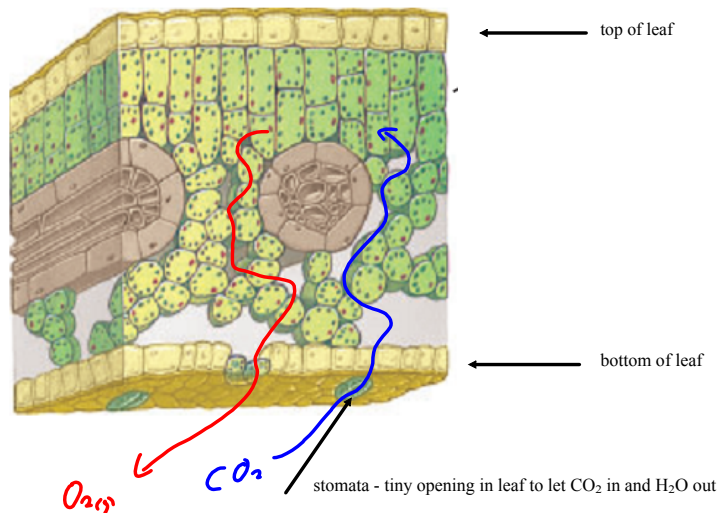
**Photosynthesis - Lesson 4 - Light Independent Reactions - pgs 192-193**

- The final stage of photosynthesis is **carbon fixation**
- CO<sub>2</sub> from the atmosphere is used to make glucose (C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>)
- This stage is also called the Calvin cycle or the Calvin-Benson cycle
- aka the light independent reaction
- This occurs in the **stroma of the cell**



- The **energy** for this process is supplied by the **ATP** molecules made in the light-dependent reaction
- The **electrons and hydrogen ions** (H<sup>+</sup>) are supplied by **NADPH**
- the **carbon and oxygen atoms** come from **CO<sub>2</sub>** molecules from the air
- the building of one glucose molecule (C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>) requires
  - **6 CO<sub>2</sub> molecules**
  - the energy from **18 ATP molecules**
  - the electrons and H<sup>+</sup> carried by **12 NADPH molecules**
- CO<sub>2</sub> must be readily available.
- CO<sub>2</sub> diffuses directly into the plant leaf cells and chloroplasts from air spaces within the leaves.
- These air spaces are connected to the outside environment via tiny openings in the surface of the leaves

*Stomata*



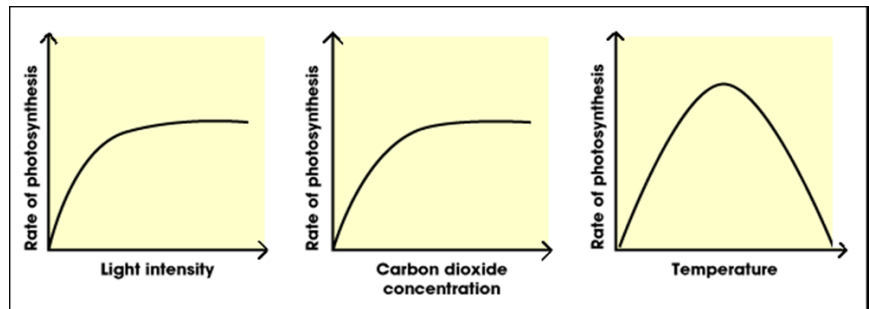
**What does the plant do with the glucose it makes?**

- some glucose (a small amount) is used by the plants cells in cellular respiration
- some is converted to starch and stored by the plant (think potatoes...yum)
- some is used to make cellulose (plant cell walls)

**Variables in Photosynthesis**

Light Intensity

CO<sub>2(g)</sub> concentration



temperature

light wavelength

