Branch 1

- chloroplasts
- double-membrane
- granum
- intermembrane space
- lumen
- region between thylakoids
- semi-autonomous organelles
- stacked
- stroma
- thylakoids

Branch 2

- 2 – C3's (PGA)
- ATP
- Calvin cycle
- Carbon dioxide binds to RUBP (C5)
- Carbon fixation
- Exit the Calvin cycle
- Light independent reactions
- NADPH
- Used to produce assorted carbohydrates
- Reduced to G3P
- Rubisco
- RUBP
- Undergo a series of rearrangements

Branch 3

- Non-cyclic photophosphorylation
- Thylakoids
- Z scheme

Branch 4

- 3 groups of carriers
- Chlorophyll and other carriers
- Chlorophyll and other carriers
- cyt b/f complex
- P680 reaction center
- P700 reaction center
- PSI
- PSII

Branch 5

- cyt b/f complex
- Electrons
- NADP+
- NADPH
- PSI
- PSII
- Water

Branch 6

- ATP synthesis
- ATP synthase complex
- Chemi-osmosis
- Lumen (intermembrane space)
- Mitochondrion
- pH 5 in lumen
- pH 8 in stroma
- pH gradient across membrane
- Protons
- Stroma

Branch 7

- 1^{st} Law of Thermodynamics
- ATP
- Chemical energy (stable)
- Chemical energy (unstable)
- Electrical energy
- Energy conversion process
- Exists as photons that travel in waves
- Carbohydrates (*i.e.,* glucose)
- NADPH
- Radiant energy