

# Biology Unit Planner: Metabolic Processes

**References:** [www.loreescience.ca](http://www.loreescience.ca) → Grade 12 Biology → Metabolic Processes  
 Nelson: Biology 12 → Unit 2: Chapter 4 & 5

Topics	Key Concepts
<ul style="list-style-type: none"> <li>• Introduction to Cellular Respiration</li> </ul>	<ul style="list-style-type: none"> <li>- Overview of how processes fit together: Glycolysis, Pyruvate Oxidation, Krebs Cycle &amp; ETC</li> <li>- Energy Carriers</li> </ul>
<ul style="list-style-type: none"> <li>• Glycolysis &amp; Pyruvate Oxidation</li> </ul>	<ul style="list-style-type: none"> <li>- Anaerobic in cytoplasm</li> <li>- Role of NAD<sup>+</sup>/NADH</li> <li>- Energy invest/harvest</li> <li>- Net 2 ATP</li> <li>- Oxidation of pyruvate</li> <li>- Names of molecules</li> </ul>
<ul style="list-style-type: none"> <li>• Kreb's Cycle</li> </ul>	<ul style="list-style-type: none"> <li>- Oxidation reactions</li> <li>- Production of NADH/FADH<sub>2</sub></li> <li>- Names of molecules</li> </ul>
<ul style="list-style-type: none"> <li>• ETC</li> </ul>	<ul style="list-style-type: none"> <li>- Matrix &amp; cristae</li> <li>- Movement of electrons</li> <li>- Coupled reactions</li> <li>- Redox reactions</li> <li>- Coenzymes</li> <li>- Role of O<sub>2</sub></li> <li>- Electrochemical gradient &amp; ATP</li> </ul>
<ul style="list-style-type: none"> <li>• Muscle Fatigue</li> </ul>	<ul style="list-style-type: none"> <li>- Calculating ATP, observing muscle fatigue</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Investigation:</b> Regulating Rate of Cellular Respiration &amp; Estimating VO<sub>2</sub> Max</li> </ul>	<ul style="list-style-type: none"> <li>- BMR, activity level, age, sex, height</li> </ul>
<ul style="list-style-type: none"> <li>• Lipid &amp; Protein Catabolism &amp;</li> <li>• Anaerobic Respiration</li> </ul>	<ul style="list-style-type: none"> <li>- deamination</li> <li>- β- oxidation</li> <li>- Fermentation</li> <li>- Recycle NAD<sup>+</sup>/NADH</li> <li>- Lactic Acid</li> <li>- Ethanol</li> </ul>
<ul style="list-style-type: none"> <li>• Photosynthesis &amp; Photosynthetic Research</li> </ul>	<ul style="list-style-type: none"> <li>- Chloroplast structure, chlorophyll, transpiration, leaf structure</li> <li>- Thylakoid &amp; stroma</li> <li>- Pigments &amp; visible spectrum</li> </ul>
<ul style="list-style-type: none"> <li>• Light Reactions</li> </ul>	<ul style="list-style-type: none"> <li>- Thylakoid membrane</li> <li>- Light &amp; electrons</li> <li>- Z-scheme ETC</li> <li>- Cyclic &amp; non-cyclic</li> <li>- Role of H<sub>2</sub>O &amp; O<sub>2</sub></li> </ul>
<ul style="list-style-type: none"> <li>• Calvin Cycle in C<sub>3</sub> Plants</li> </ul>	<ul style="list-style-type: none"> <li>- Rubisco</li> <li>- RuBP &amp; Redox</li> <li>- Carbon Fixation</li> </ul>
<ul style="list-style-type: none"> <li>• Photorespiration, C<sub>4</sub> and CAM Plants</li> </ul>	<ul style="list-style-type: none"> <li>- Alternative forms of carbon fixation</li> </ul>
<ul style="list-style-type: none"> <li>• Light Response Curve and Factors that Affect Rate of Photosynthesis</li> </ul>	<ul style="list-style-type: none"> <li>- Light curves</li> </ul>

# Metabolic Processes Terms to Know

- 1,3-Bisphosphoglycerate
- 1,3-bisphosphoglycerate
- 2-Phosphoglycerate
- 3-Phosphoglycerate
- Absorption
- Acetaldehyde
- Acetyl-CoA
- ADP
- Aerobic
- Amino Acids
- Anaerobic
- Antenna Pigment
- Athocyanins
- ATP
- ATP Synthase
- b6-f Complex
- Bundle-Sheath
- C.B. Van Niel
- C3 Plant
- C4 Plant
- Calvin Cycle
- CAM Plant
- Carotenoids
- Chemical Energy
- Chlorophyll
- Chlorophyll a
- Chlorophyll b
- Chloroplast
- Citrate
- CO<sub>2</sub> Limited
- Coupled Reaction
- Cyanobacteria
- Cyclic Electron Flow
- Cytosol
- Deamination
- DHAP
- Dihydroxyacetone-Phosphate
- Electron Transport Chain
- Electronegativity
- Endosymbiotic Theory
- Energy Return
- Ethanol
- F.F. Blackman
- FAD<sup>+</sup>/FADH<sub>2</sub>
- Fatty Acids
- Fermentation
- Ferredoxin
- Flaccid
- Fructose-1,6-Bisphosphate
- Fructose-6-Phosphate
- Gluconeogenesis
- Glucose-6-Phosphate
- Glyceraldehyde- 3-Phosphate
- Glycerol
- Glycolysis
- Guard Cell
- Heavy Water
- Inter-membrane
- Investment
- Irradiance
- J.B. Van Helmont
- Jan Ingenhousz
- Joseph Priestley
- K<sup>+</sup> Diffusion
- Krebs's Cycle
- Lactate
- Lactic Acid
- Lactic Threshold
- Light Dependent Reactions
- Light Independent Reactions
- Light Limited
- Light-Compensation Point
- Light-Saturation Point
- Magnesium
- Malate
- Malic Acid
- Mesophyll
- Mitochondia
- Mitochondrial Matrix
- NAD<sup>+</sup>/NADH
- NADP Reductase
- NADP<sup>+</sup>/NADPH
- Non-Cyclic Electron Flow
- Oxaloacetic Acid
- Oxidative Phosphorylation
- P680
- P700
- PEP Carboxylase
- Phosphoenolpyruvate
- Phosphofructokinase
- Photons
- Photophosphorylation
- Photorespiration
- Photosynthesis
- Photosystem
- Phytol tail
- Pigment
- Plastocyanin
- Plastoquinone
- Porphyrin Ring
- Primary Electron Acceptor
- Product
- Pyruvate
- Pyruvate Oxidation
- Reactant
- Reaction Center Chlorophyll
- Redox
- Respiration
- Ribulose bisphosphate
- RUBISCO
- RuBP Carboxylase
- S.M. Ruben & M. Kamen
- Spectrum
- Stomata
- Stroma
- Substrate-level Phosphorylation
- Sugar Splitting
- Sulfur Bacteria
- Thylakoid Interior
- Transpiration
- Turgid
- Vacuole
- VO<sub>2</sub> Max
- Wavelength
- Xanthophylls
- β-Oxidation