# SBI4U METABOLIC PROCESSES Unit Checklist

**Mastery Checks may be attempted more than once and are not considered complete until ≥ 70% is achieved.**

Notes and activities will be checked for completion & corrections.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Objective(s)</th>
<th>Key Concepts</th>
<th>Approx. # classes</th>
<th>Notes</th>
<th>Mastery Check</th>
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</thead>
</table>
| 1     | Intro to Cellular Respiration & Types of Reactions: Understand how processes fit together: Glycolysis, Pyruvate Oxidation, Krebs Cycle & ETC Identify & describe the 4 main types of biochemical reactions | - ATP input and output  
- Energy Carriers  
- Anabolic  
- Catabolic  
- Redox  
- Neutralization | 2 | | |
| 2     | Glycolysis & Pyruvate Oxidation: Explain the chemical changes and energy conversions occurring Identify molecules and their roles throughout the processes | - Anaerobic in cytoplasm  
- Role of NAD+/NADH  
- Energy invest/harvest  
- Net 2 ATP  
- Oxidation of pyruvate  
- Names of molecules | 1 | | |
| 3     | Kreb’s Cycle / Citric Acid Cycle: Explain the chemical changes and energy conversions associated with Kreb’s Cycle Identify molecules and their roles throughout the process | - Oxidation reactions  
- Production of NADH/FADH2  
- Names of molecules | 2 | | |
| 4     | Electron Transport Chain: Explain the chemical changes and energy conversions associated with the E.T.C. Identify molecules and their roles throughout the process | - Matrix & cristae  
- Movement of electrons  
- Coupled reactions  
- Redox reactions  
- Coenzymes  
- Role of O2  
- Electrochemical gradient & ATP | 2 | | |
| 5     | Regulating Cellular Respiration & Alternative Pathways: Explain the process of using proteins and lipids as energy molecules and how they fit into the chemical processes | - Calculating ATP  
- Muscle fatigue, BMR, activity level...  
- Deamination  
- β- oxidation | 2 | | |
| 6     | Anaerobic Respiration: Explain the chemical changes and energy conversions associated with anaerobic cellular respiration | - Fermentation  
- Recycle NAD+/NADH  
- Lactic Acid  
- Ethanol | 2 | | |
| 7     | Photosynthesis – Light Reactions & Calvin Cycle: Explain the chemical changes and energy conversions associated with photosynthesis Describe, compare & illustrate the matter and energy transformations occurring during cellular respiration and photosynthesis | - Chloroplast structure, chlorophyll, transpiration, leaf structure  
- Thylakoid, membranes & stroma  
- Pigments & visible spectrum  
- Light & electrons  
- Z-scheme, Cyclic & Non-cyclic ETC  
- Role of H2O & O2  
- RUBISCO  
- RuBP & Redox  
- Carbon Fixation | 3 | | |
| 8     | Photosynthesis – Environment & Light Curves: Explain how environmental conditions affect the chemical changes and energy conversions of photosynthesis and photorespiration | - Light Curves  
- Irradiance  
- Stomata  
- Climate change & effects on chemical processes  
- Light saturation | * 2 lab days* | 3 | |
| 9     | Photosynthesis in C4 & CAM Plants: Explain how plants have adapted and have altered the chemical changes and energy conversions associated with photosynthesis | - Alternative forms of carbon fixation  
- C3, C4 & CAM Plants  
- Photorespiration  
- Bundle sheath, mesophyll,  
- PEP carboxylase | 2 | | |

Aerobic Respiration Quiz: Thursday October 26th

Cellular Respiration TEST: Tuesday October 30th

Photosynthesis & Comparisons TEST:
Assessments & Labs

All assessments & labs must be completed in class and are due at the end of the in-class work period(s) unless otherwise indicated.

<table>
<thead>
<tr>
<th>SUMMATIVE EVALUATIONS</th>
<th>DATE</th>
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<tr>
<td>Aerobic Respiration Quiz</td>
<td>Thursday October 26th</td>
</tr>
<tr>
<td>Cellular Respiration Test</td>
<td>Tuesday October 30th</td>
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<tr>
<td>Photosynthesis Lab</td>
<td></td>
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<tr>
<td>Photosynthesis &amp; Comparisons Test</td>
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Metabolic Processes Terms to Know

- 1,3-Bisphosphoglycerate
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- 2-Phosphoglycerate
- 3-Phosphoglycerate
- Absorption
- Acetaldehyde
- Acetyl-CoA
- ADP
- Aerobic
- Amino Acids
- Anaerobic
- Antenna Pigment
- Athocyanins
- ATP
- ATP Synthase
- b6-f Complex
- Bundle-Sheath
- C3 Plant
- C4 Plant
- Calvin Cycle
- CAM Plant
- Carotenoids
- Chemical Energy
- Chlorophyll
- Chlorophyll a
- Chlorophyll b
- Chloroplast
- Citrate
- CO2 Limited
- Coupled Reaction
- Cyanobacteria
- Cyclic Electron Flow
- Cytosol
- Light Independent Reactions
- Light Limited
- Light-Compensation Deamination
- DHAP
- Dihydroxyacetone-Phosphate
- Electron Transport Chain
- Electronegativity
- Endosymbiotic Theory
- Energy Return
- Ethanol
- FAD+/FADH2
- Fatty Acids
- Fermentation
- Ferrodoxin
- Fructose-1,6-Bisphosphate
- Fructose-6-Phosphate
- Gluconeogenesis
- Glucose-6-Phosphate
- Glyceraldehyde-3-Phosphate
- Glycerol
- Glycolysis
- Guard Cell
- Heavy Water
- Inter-membrane
- Investment
- Irradiance
- K+ Diffusion
- Kreb’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
- Mitochondria
- Mitochondrial Matrix
- NAD+/NADH
- NADP Reductase
- NADP+/NADPH
- Non-Cyclic Electron Flow
- Oxaloacetic Acid
- Oxidative Phosphorylation
- P680
- P700
- PEP Carboxylase
- Phospho-Enolpyruvate
- Phosphofructokinase
- Photons
- Photophosphorylation
- Photosynthesis
- Photosystem
- Phytol tail
- Pigment
- Plastocyanin
- Plastoquinone
- Porphyrin Ring
- Primary Electron Acceptor
- Product
- Pyruvate
- Pyruvate Oxidation
- Reactant
- Reaction Center
- Chlorophyll
- Redox
- Respiration
- Ribulose Biphosphate
- RUBISCO
- RuBP Carboxylase
- Spectrum
- Stomata
- Stroma
- Substrate-level Phosphorylation
- Sugar Splitting
- Sulfur Bacteria
- Thylakoid Interior
- Transpiration
- Vacuole
- VO2 Max
- Wavelength
- Xanthophylls
- β-Oxidation

Mastery Checks:

- Must be written during class or after school during supervised extra help times.
- Up to 3 attempts are permitted during class time. If more attempts are required they must be completed after school.
- Mastery or a minimum of 2 attempts must be completed to consider a topic complete and allow you to write a unit test.
- Keep track of the number of attempts on the unit checklist.
- Must be attempted as you progress through the topics —do not let them accumulate until the end of the unit.