

SBI4U METABOLIC PROCESSES Unit Checklist

Name: _____



Mastery Checks may be attempted more than once and are not considered complete until $\geq 70\%$ is achieved.

Notes and activities will be checked for completion & corrections.

Topic	Objective(s)	Key Concepts	Approx. # classes	Notes	Mastery Check
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		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
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		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
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/FADH ₂ - Names of molecules	2		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
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 O ₂ - Electrochemical gradient & ATP	2		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Aerobic Respiration Quiz: Thursday October 26th					
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		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
6	Anaerobic Respiration: Explain the chemical changes and energy conversions associated with anaerobic cellular respiration	- Fermentation - Recycle NAD ⁺ /NADH - Lactic Acid - Ethanol	2		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Cellular Respiration TEST: Tuesday October 30th					
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 H ₂ O & O ₂ - RUBISCO - RuBP & Redox - Carbon Fixation	3		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
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		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
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 - C ₃ , C ₄ & CAM Plants - Photorespiration - Bundle sheath, mesophyll, - PEP carboxylase	2		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
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.

SUMMATIVE EVALUATIONS	DATE
Aerobic Respiration Quiz	Thursday October 26th
Cellular Respiration Test	Tuesday October 30th
Photosynthesis Lab	
Photosynthesis & Comparisons Test	

Metabolic Processes Terms to Know

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

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