

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		Got It! □□□□
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		Not Yet!
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		Got It! □□□□
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		Not Yet!
Aerobic Respiration Quiz: Tuesday October 22nd					
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		Got It! □□□□
6	Anaerobic Respiration: Explain the chemical changes and energy conversions associated with anaerobic cellular respiration	- Fermentation - Recycle NAD ⁺ /NADH - Lactic Acid - Ethanol	2		Not Yet!
Cellular Respiration TEST: Tuesday October 29th					
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		Got It! □□□□ Not Yet!
8	Photosynthesis – Environment & Light Curves: Explain how environmental conditions affect the chemical changes and energy conversions of photosynthesis and photorespiration. Lab	- Light Curves - Irradiance - Stomata - Climate change & effects on chemical processes - Light saturation	3		Got It! □□□□
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		Not Yet!
Photosynthesis & Comparisons TEST: Monday November 11th					

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	Tuesday October 22nd
Cellular Respiration Test	Tuesday October 29th
Photosynthesis Lab	Tuesday November 5th & Thursday November 7th
Photosynthesis & Comparisons Test	Monday November 11th

Metabolic Processes Terms to Know

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|---------------------------|---------------------------------------|-------------------------------|-----------------------------------|
| - 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 |
| - Antenna Pigment | - FAD ⁺ /FADH ₂ | - Mesophyll | - Chlorophyll |
| - Anthocyanins | - Fatty Acids | - Mitochondria | - Redox |
| - ATP | - Fermentation | - Mitochondrial Matrix | - Respiration |
| - ATP Synthase | - Ferredoxin | - NAD ⁺ /NADH | - Ribulose biphosphate |
| - b6-f Complex | - Fructose-1,6-Bisphosphate | - NADP Reductase | - RUBISCO |
| - Bundle-Sheath | - Fructose-6- Phosphate | - NADP ⁺ /NADPH | - RuBP Carboxylase |
| - C3 Plant | - Gluconeogenesis | - Non-Cyclic Electron Flow | - Spectrum |
| - C4 Plant | - Glucose-6- Phosphate | - Oxaloacetic Acid | - Stomata |
| - Calvin Cycle | - Glyceraldehyde- 3-Phosphate | - Oxidative Phosphorylation | - Stroma |
| - CAM Plant | - Glycerol | - P680 | - Substrate-level Phosphorylation |
| - Carotenoids | - Glycolysis | - P700 | - Sugar Splitting |
| - Chemical Energy | - Guard Cell | - PEP Carboxylase | - Sulfur Bacteria |
| - Chlorophyll | - Heavy Water | - Phosphoenolpyruvate | - Thylakoid Interior |
| - Chlorophyll a | - Inter-membrane | - Phosphofructokinase | - Transpiration |
| - Chlorophyll b | - Irradiance | - Photons | - Vacuole |
| - Chloroplast | - K ⁺ Diffusion | - Photophosphorylation | - VO ₂ Max |
| - Citrate | - K ⁺ Diffusion | - Photorespiration | - Wavelength |
| - CO ₂ Limited | - Krebs' / Citric Acid Cycle | - Photosynthesis | - Xanthophylls |
| - Coupled Reaction | | - Photosystem | - β-Oxidation |
| - Cyanobacteria | | | |
| - Cyclic Electron Flow | | | |
| - Cytosol | | | |

Mastery Checks:

- May be attempted more than once within Mastery Check "window"
- Extra practice must be completed & shown to get another code
- Must be written during class or after school during supervised extra help times.
- Mastery is considered ≥ 75%

