

# Supplemental Material

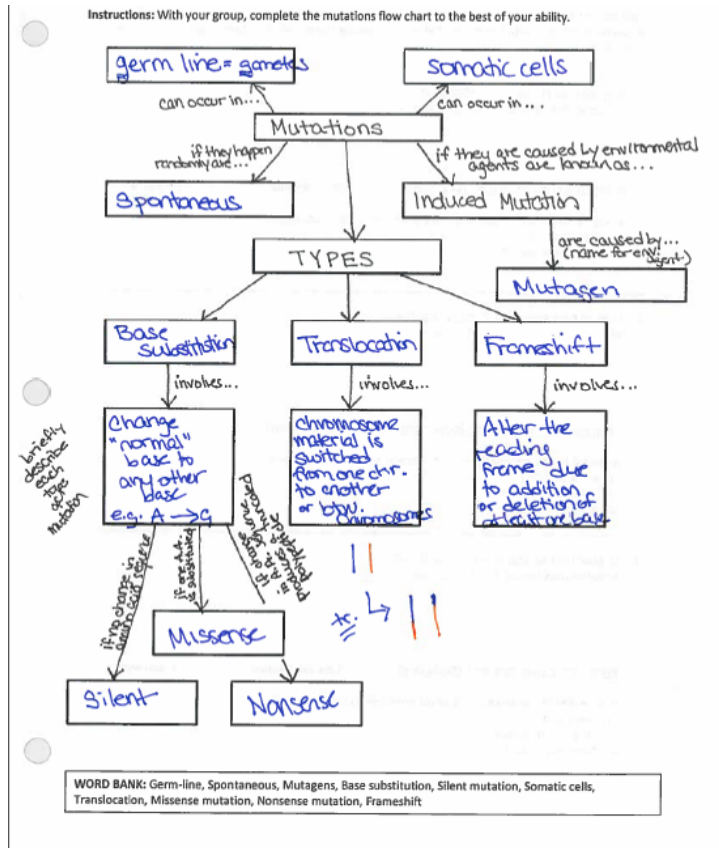
*CBE—Life Sciences Education*

Cleveland *et al.*

Examples of Graphic Organizers and Worksheets used in Matthew's Section of Principles of Biology

	What goes into the process or reaction?	What happens (big picture)?	What products are created?	Net ATP produced
<b>Glycolysis</b> CYTOSOL ←!	- Glucose - 2 molecules of ATP	- Glucose is converted to pyruvate	- 2 pyruvate - 4 ATP (substrate level phosphorylation) - NADH (2)	2
<b>Pyruvate Breakdown</b> MITOCHONDRIA MATRIX	- Pyruvate	- CO <sub>2</sub> from pyruvate removed - Joins to acetyl + CoA to form acetyl-CoA * done by pyruvate dehydrogenase	- 2 NADH - Acetyl-CoA (2)	∅
<b>Krebs Cycle</b> MATRIX	- Acetyl-CoA	- Acetyl attaches to oxaloacetate to form citric acid. - Krebs cycle carried out <u>care of various enzymes</u> - Oxaloacetate regenerated per acetyl-CoA	- 2 CO <sub>2</sub> - 1 ATP (substrate-level phosph.) - 3 NADH - 1 FADH <sub>2</sub>	2
<b>Oxidative Phosphorylation</b> MATRIX	- NADH & FADH <sub>2</sub> from previous step	- NADH & FADH <sub>2</sub> fed into electron transport chain - H <sup>+</sup> gradient is formed - gradient used to fuel ATP production	30-34 ATP (chemiosmosis)	30-34
				TOTAL: 34-38

**Figure S1.** Graphic organizer used to compare and contrast the various processes involved in aerobic cellular respiration.



**Figure S2.** Worksheet used to describe and compare various types of mutations.