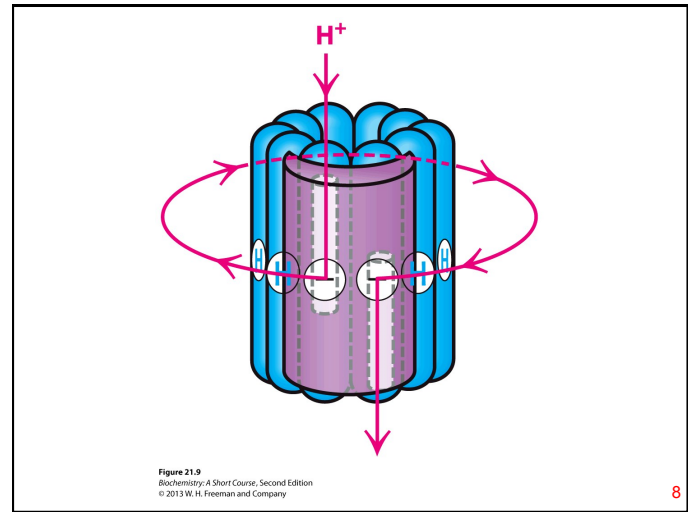
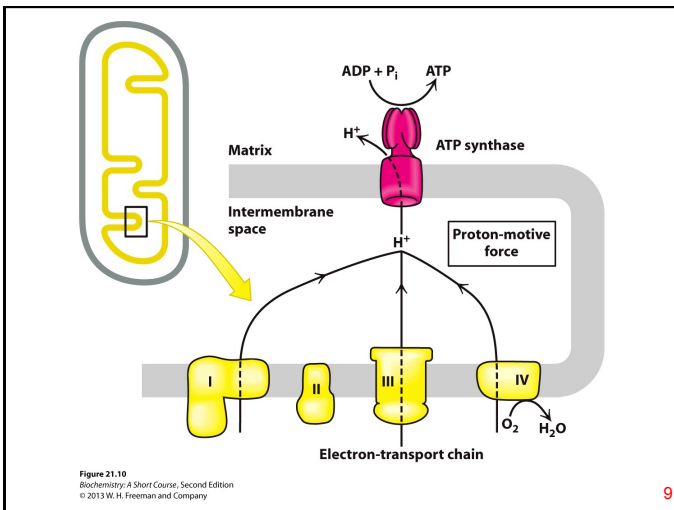


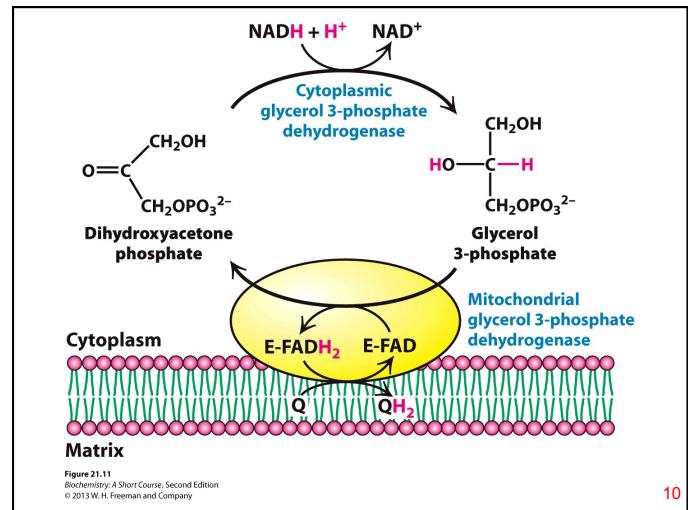
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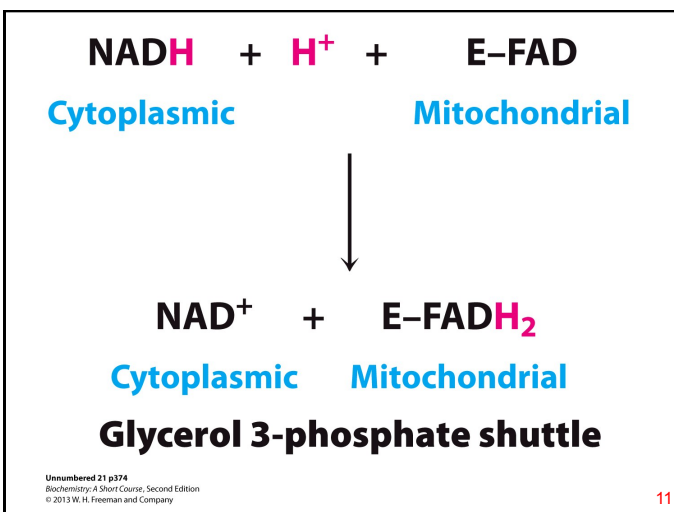
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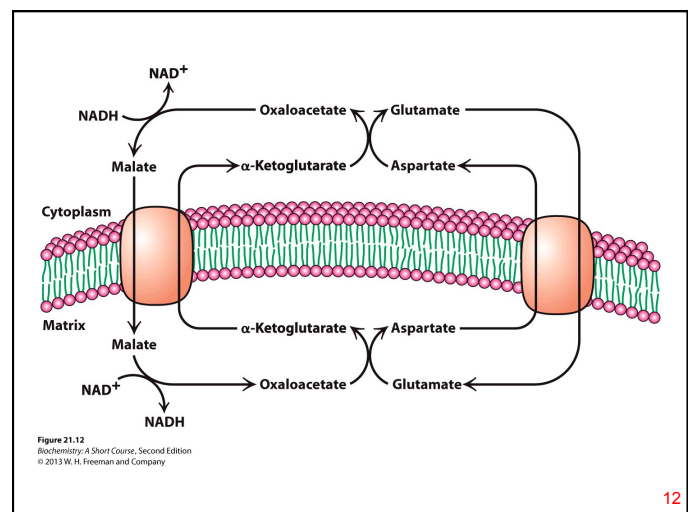
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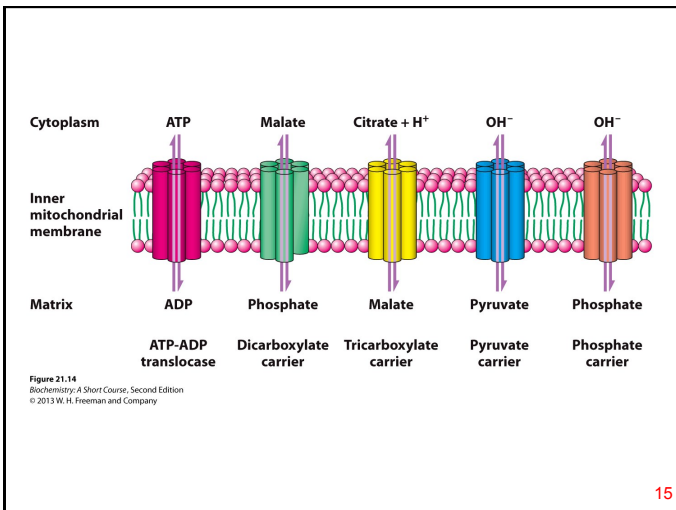
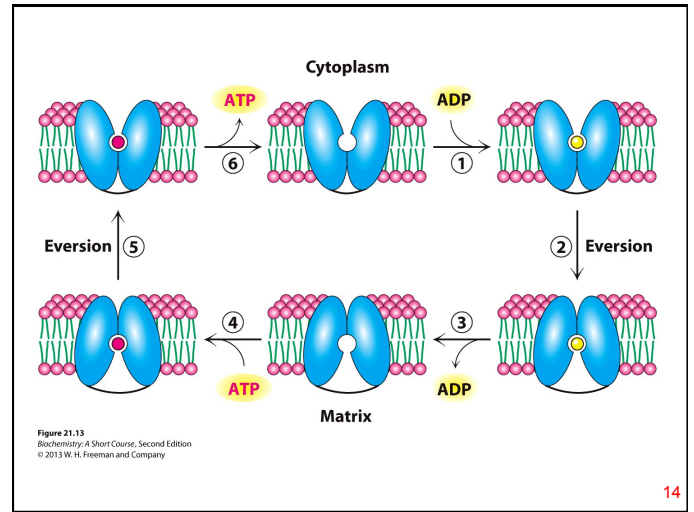
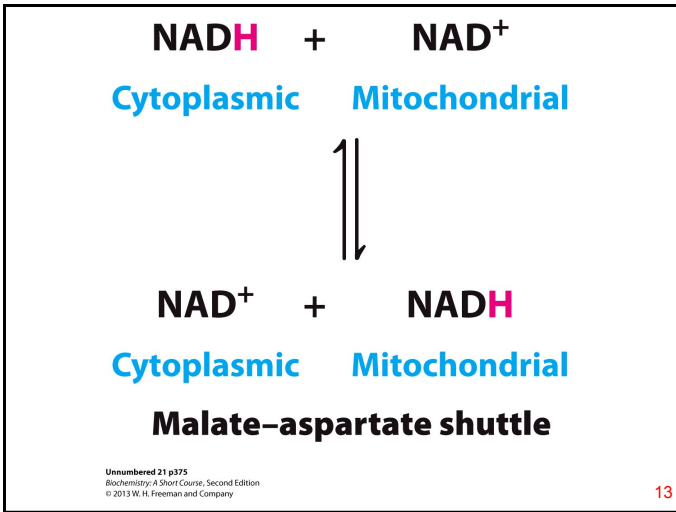
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**Table 21.1 ATP yield from the complete oxidation of glucose**

Reaction sequence	ATP yield per glucose molecule
<b>Glycolysis: Conversion of glucose into pyruvate (in the cytoplasm)</b>	
Phosphorylation of glucose	-1
Phosphorylation of fructose 6-phosphate	-1
Dephosphorylation of 2 molecules of 1,3-BPG	+2
Dephosphorylation of 2 molecules of phosphoenolpyruvate	+2
<b>Conversion of pyruvate into acetyl CoA (inside mitochondria)</b>	
2 molecules of NADH are formed	
<b>Citric acid cycle (inside mitochondria)</b>	
2 molecules of ATP (or GTP) are formed from 2 molecules of succinyl CoA	+2
6 molecules of NADH are formed in the oxidation of 2 molecules each of isocitrate, α-ketoglutarate, and malate	
2 molecules of FADH <sub>2</sub> are formed in the oxidation of 2 molecules of succinate	
<b>Oxidative phosphorylation (inside mitochondria)</b>	
2 molecules of NADH are formed in glycolysis; each yields 1.5 molecules of ATP (assuming transport of NADH by the glycerol 3-phosphate shuttle)	+3
2 molecules of NADH are formed in the oxidative decarboxylation of pyruvate; each yields 2.5 molecules of ATP	+5
2 molecules of FADH <sub>2</sub> are formed in the citric acid cycle; each yields 1.5 molecules of ATP	+3
6 molecules of NADH are formed in the citric acid cycle; each yields 2.5 molecules of ATP	+15
<b>Net Yield Per Molecule Of Glucose</b>	<b>+30</b>

Source: The ATP yield of oxidative phosphorylation is based on values given in P. C. Hinkley, M. A. Kumar, A. Resetar, and D. L. Harris, *Biochemistry* 30:3576, 1991.  
 Note: The current value of 30 molecules of ATP per molecule of glucose supersedes the earlier one of 36 molecules of ATP. The stoichiometries of proton pumping, ATP synthesis, and metabolite transport should be regarded as estimates. About two more molecules of ATP are formed per molecule of glucose oxidized when the malate–aspartate shuttle rather than the glycerol 3-phosphate shuttle is used.

Table 21.1  
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