ANSWERS  
1. In the thylakoid space  
2. From water splitting; Proton pumps in ETC move H+ from stroma to thylakoid space  
3. NADP+  
4. C6H12O6 + 6 O2 → 6 CO2 + 6 H2O + energy  
5. Exact opposite  
6. Red and blue-violet  
7. competitive  
8. B-non-cyclic  
9. If ETC gradient doesn’t make ATP, more sugar must be metabolized for energy needs.   
 Blocking production of ATP can KILL you. Massive burning of sugar can cause patient to overheat leading to seizures/death.  
10. Need more ATP than NADPH to do Calvin cycle  
11. CO2  
12. O2, ATP, NADPH  
13. B; products have more energy than reactants  
14. FALSE; enzymes change activation energy but NOT overall ∆G  
15. allosteric  
16. Fermentation  
17. NADH drops off its electrons higher up in the ETC; FADH2 skips the first proton pump  
18. Glycolysis- net 2 ATP; Krebs cycle- 2 ATP; ETC- (10 NADH X3 + 2 FADH2 X 2) =34 ATP  
 (Plus net 2 from glycolysis + 2 from Krebs minus 2 ATP for transport = 36 total ATP/1 glucose)  
19. Availability of oxygen  
20. Alcoholic- bacteria make beer, wine; yeast makes bread  
 Lactic acid-human muscle cells during exercise;   
 bacteria –yogurt, sauerkraut, pickles  
21. Needs to get rid of built up pyruvic acid AND regenerate NAD+ so glycolysis can continue  
22. oxygen  
23. As CO2 in atmosphere  
24. Citric acid cycle/tricarboxylic acid (TCA) cycle  
25. Increasing temp speeds up reaction up to a point. Too hot-denatures enzymes  
26.

27. Disrupts hydrogen/ionic bonds/phobic/philic interactions in 2°, 3°, 4° structure   
 (NOT primary)  
28. Magnesium (Mg)  
29. Cells couple the – Δ G reaction of hydrolysis of ATP to provide power for + Δ G reactions.  
30. Entropy (disorder)   
31. Mitochondria or chloroplasts  
32. Substrate level phosphorylation  
33. Two turns. Each makes a 3-carbon molecule (G3P)  
34. Splitting of water- B (thylakoid space);   
 Calvin cycle-A (stroma);   
 Electron transport chain –C (thylakoid membrane);  
 Phosphorylation of ADP →ATP – A (stroma);   
 Reduction of NAPD+ → NADPH- A (stroma);   
 build up of H+ ions – B (thylakoid space)  
35. Feedback inhibition (negative feedback)  
 non-competitive  
 Stopping pathway at first enzyme saves cell energy and time because  
 intermediate products aren’t produced  
36. Plants store as starch, animals store glycogen  
 Glycogen is burned next and then fat  
 Beta-oxidation of fatty acids from fat; Fatty acid tails are cut into 2 carbon units  
 and fed into Krebs via acetyl-CoA

37. Green plants undergo photosynthesis to remove CO2 from atmosphere, produce   
 carbohydrates, and release O2 gas into atmosphere.  
 Heterotrophs take in carbs and use cellular respiration break down sugars using O2 from   
 atmosphere and return CO2 to atmosphere which plants can use . . . . (yeah it’s a cycle  
38. REFELCTED; we see light reflected off of objects  
39. Plants don’t absorb green wavelengths very well; growth would be inhibited and ability to   
 photosynthesize would be decreased