**ADP, ATP, & Cellular Respiration  
*PowerPoint Question Guide***

1. \_\_\_\_\_\_\_ is the energy used by all cells.

2. ATP stands for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

3. ATP is an \_\_\_\_\_\_\_\_\_\_\_ molecule containing high-energy \_\_\_\_\_\_\_\_\_\_\_\_ bonds.

4. The sugar in ATP is \_\_\_\_\_\_\_\_\_\_\_\_, while the nitrogen base is \_\_\_\_\_\_\_\_\_\_\_.

5. How many phosphate groups does ATP contain?

6. How do we get energy from ATP?

7. Make a simple sketch of ATP and show the high-energy bond that is broken.

8. To break the last phosphate bond in ATP, \_\_\_\_\_\_\_\_\_ must be added.

9. The process is called \_\_\_\_\_\_\_\_\_\_\_.

10. What enzyme is used to help weaken & break the last phosphate bond in ATP?

11. Can ATP be remade?

12. When the last phosphate bond of ATP is broken, \_\_\_\_\_\_\_\_\_\_ and a free \_\_\_\_\_\_\_\_\_\_ form.

13. What enzyme can be used to rejoin ADP and a free phosphate to make more ATP?

14. Using ATP's energy and then remaking it is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cycle.

15. In the body, ATP is made during the process of \_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

16. Cellular respiration takes place in both \_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_.

17. Cellular respiration requires the gas \_\_\_\_\_\_\_\_\_\_\_\_.

18. In cellular respiration, \_\_\_\_\_\_\_\_\_\_\_\_\_ is oxidized (loses electrons) and \_\_\_\_\_\_\_\_\_\_\_ is reduced (gains electrons).

19. The breakdown of one glucose molecule results in \_\_\_\_\_\_\_\_ to \_\_\_\_\_\_\_ ATP molecules of energy.

20. Write the overall equation for cellular respiration.

21. Cellular respiration is an example of a \_\_\_\_\_\_\_\_ reaction.

22. REDOX stands for \_\_\_\_\_\_\_\_\_\_\_\_\_-\_\_\_\_\_\_\_\_\_\_\_\_ reactions.

23. What are the products of cellular respiration?

24. What carries the energized electrons from glucose in cellular respiration?

25. NAD+\_ is a \_\_\_\_\_\_\_\_\_\_\_\_\_ that forms \_\_\_\_\_\_\_\_\_\_\_\_ when it is reduced (picks up electrons).

26. What does NAD+ stand for?

27. Name a second coenzyme that acts as an energy carrier in cellular respiration.

28. What does FAD+ stand for?

29. FAD+ becomes \_\_\_\_\_\_\_\_\_\_ whenever it is reduced.

30. Cellular respiration like photosynthesis is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ because it involves many reactions to make or break down carbohydrates.

31. Cellular respiration is an \_\_\_\_\_\_\_\_\_\_\_\_\_\_ reaction because it releases energy from glucose.

32. Glucose is broken down into \_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_.

33. Is cellular respiration catabolic or anabolic? explain why.

34. Name the 3 stages of cellular respiration.

35. \_\_\_\_\_\_\_\_\_\_\_\_ takes place in the cytoplasm of cells., while the \_\_\_\_\_\_\_\_\_\_ cycle and ETC take place in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

36. Sketch and label the parts of a mitochondrion.

37. Describe the outer surface of the mitochondria.

38. The inner membrane of the mitochondria is \_\_\_\_\_\_\_\_\_\_\_.

39. The folds of the inner mitochondrial membrane are called \_\_\_\_\_\_\_\_\_\_\_.

40. The innermost space of the mitochondria is known as the \_\_\_\_\_\_\_\_\_\_\_.

41. Using the PowerPoint diagram, answer the following:

     a. Glycolysis occurs where?

     b. Glycolysis produces what energy molecule?

     c. The products of glycolysis enter what other part of a cell?

     d. What organic compound enters the Krebs cycle?

     e. Electron carriers (NADH & FADH) carry electrons to what?

     f. The ETC occurs across what?

     g. What is the product at the end of the ETC?

     h. What gas is added at the end of the ETC?

     i. The Krebs cycle occurs where?

     j. What gas is a product of the Krebs cycle?

     k. Is ATP made in the Krebs cycle?

     l. Is ATP in the ETC?

42. Is glycolysis aerobic or anaerobic? Explain why.

43. Glycolysis requires how much ATP to get started?

44. In glycolysis, glucose is split into two molecules of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ or pyruvic \_\_\_\_\_\_\_\_\_.

45. Is any CO2 produced during glycolysis?

46. Glycolysis uses 2 ATP and produces \_\_\_\_\_\_ ATP.

47. How much NADH (energy carrier) is made during glycolysis?

48. Glycolysis does \_\_\_\_\_\_ require oxygen but may occur if \_\_\_\_\_\_\_\_\_ is present.

49. If oxygen is NOT present, the products of glycolysis enter a process called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

50. Fermentation is an \_\_\_\_\_\_\_\_\_\_\_\_\_ process because no \_\_\_\_\_\_\_\_\_\_\_ is needed.

51. Name the 2 types of fermentation.

52. Which fermentation occurs in tired muscle cells?

53. \_\_\_\_\_\_\_\_\_ acid builds up and makes muscles feel tired.

54. \_\_\_\_\_\_\_\_\_\_\_\_ fermentation in yeasts produces an alcohol called \_\_\_\_\_\_\_\_\_\_\_\_\_.

55. Fermentation only nets \_\_\_\_\_\_ molecules of ATP.

56. Why did Hans Krebs receive the Nobel Prize in medicine in 1953?

57. Why did he have to leave Germany before WWII?

58. Does the Krebs cycle need oxygen?

59. Processes needing oxygen are said to be \_\_\_\_\_\_\_\_\_\_\_\_.

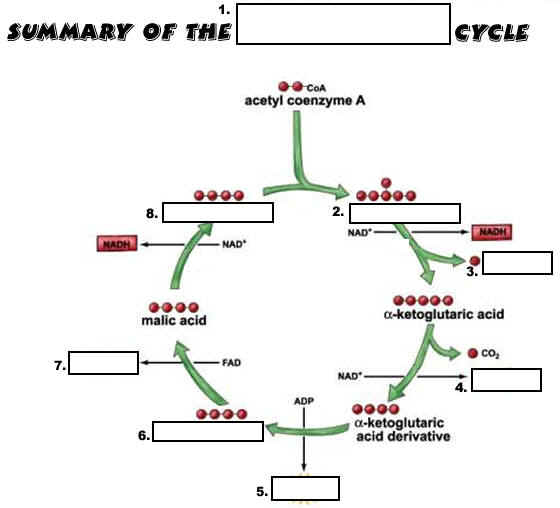
60. How many turns of the Krebs cycle are needed to burn one molecule of glucose?

61. What gas is made during the Krebs Cycle?

62. Where does the Krebs cycle take place?

63. TWO TURNS of the Krebs cycle produces \_\_\_\_\_\_ CO2 molecules, \_\_\_\_\_\_ NADH, \_\_\_\_\_FADH, and \_\_\_\_ ATP molecules.

64. Label the parts of the Krebs Cycle.



65. The ETC occurs across the inner membrane of the \_\_\_\_\_\_\_\_\_\_\_\_ and produces \_\_\_\_\_\_\_\_ as an end product.

66. The ETC uses the energized electrons carried by the coenzymes \_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_ to make 34 ATP's of energy.

67. Each NADH makes \_\_\_\_\_\_\_ ATP's, while each FADH makes only \_\_\_\_\_\_ ATP's.