

1. Define/Describe:
 - a. chromatid- duplicate half of a chromosome
 - b. Centromere- holds chromatids together
 - c. Cytokinesis in plant cells- cell plate divides cytoplasm
 - d. Cytokinesis in animal cells- cleavage furrow divides cytoplasm
 - e. Crossing over- chromosomes exchange genetic material
 - f. Cancer- uncontrolled cell growth
 - g. Checkpoint- critical point that regulates the cell cycle

2. How many chromosomes are in a human egg cell?
23
3. Which stage of the cell cycle occupies most of the cell's life?
Interphase
4. List the correct sequence of the five stages of the cell cycle.
G1 → S → G2 → M → C

5. Describe what happens in the following phases of mitosis:

- a. prophase- nuclear envelop breaks down, spindle fibers form, chromatin condenses
- b. Metaphase- chromosomes align along the equator of the cell
- c. Anaphase- sister chromatids separate to opposite poles of the cell
- d. Telophase- nuclear membrane forms, chromosomes decondense, cytokinesis begins

6. Using the illustration below, put the correct stage by the number it corresponds to.

1. Anaphase
 2. Interphase
 3. Metaphase
 4. Prophase
 5. Telophase
7. Using the above illustration, which stage does mitosis begin?
4

8. How many chromosomes does a typical human cell contain? 46 After mitosis and cytokinesis, how many chromosomes do the 2 new daughter cells contain? 46

9. Describe what happens in the following phases of meiosis I:

- a. Prophase I- crossing over occurs, spindle fibers form, chromatin condenses
- b. Metaphase I- homologous chromosomes align along the equator of the cell
- c. Anaphase I- homologous chromosomes separate to opposite poles of the cell
- d. Telophase I- nuclear membrane reforms, cell begins to divide into 2 new daughter cells

10. What happens to normal cells when they become very crowded?

Cell division is turned off, and they stop dividing.

11. What is the difference between an internal and external signal?

Internal- comes from within the cell (hormones)

External- comes from outside the cell (density)

12. What is the difference between a benign and malignant tumor?

Benign- tumor stays in the original site

Malignant- tumor moves and impairs the function of other organs

13. What is the main goal of meiosis?

To produce 4 haploid gamete cells

14. What is crossing over, and when does crossing over occur?

What: chromosomes exchange genetic material

When: occurs during Prophase I

15. What happens to the chromosomes during anaphase II of meiosis II?

Sister chromatids separate to opposite poles of the cell

16. What is the role of the spindle fibers in cell division?

To help the chromosomes move and divide

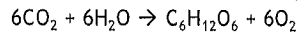
ENERGY
STANDARD B-3.1
3-2, 3-3

17. Define:

a. photosynthesis- converts solar energy (sun) into chemical energy (glucose)

b. Fermentation- occurs in the absence of oxygen (lactic acid or alcoholic)

18. What is the equation for photosynthesis?



19. What is the ultimate source of energy for all living things on Earth?

Sun

20. What is the role of chlorophyll in photosynthesis?

Pigment that absorbs sunlight

21. List the reactants of photosynthesis:

Carbon dioxide and water

22. List the products of photosynthesis:

Glucose and oxygen

23. What are the two reactions that occur during photosynthesis? List what is made during each reaction.

1. Light dependent- makes ATP and NADPH (releases Oxygen)

2. Light independent- makes glucose

24. What are the two energy carrying molecules?

ATP and NADPH

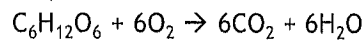
25. What is the source of oxygen produced during photosynthesis?

Water

26. What is the major atmospheric byproduct of photosynthesis?

Oxygen

27. What is the equation for cellular respiration?



28. What occurs during glycolysis?

Glucose is broken down into 2 pyruvic acids and 2 ATP molecules are produced

29. What is produced when muscles are exercised in the absence of oxygen?

Lactic acid

30. What type of organisms perform alcohol fermentation?

Yeast and bacteria

31. Describe what happens when a phosphate group is removed from ATP.

ATP becomes ADP and energy is released

32. What two stages take place in aerobic respiration?

Krebs Cycle and Electron Transport Chain

33. What is the difference between glycolysis and aerobic respiration?

Glycolysis- occurs in the absence of oxygen

Aerobic respiration- occurs in the presence of oxygen

34. The main goal of respiration is to produce ATP for all living organisms.

35. What is the relationship between cellular respiration and photosynthesis?

CR- breaks down glucose

Photosynthesis- makes glucose

They are opposites

36. Which stage of cellular respiration produces the most energy?

ETC

37. How is energy released in an ATP molecule?

The phosphate bonds are broken

38. Contrast ADP from ATP.

ADP- 2 phosphates (di)

ATP- 3 phosphates (tri)