The background of the slide is a light gray gradient with several realistic water droplets of various sizes scattered across it. The droplets have highlights and shadows, giving them a three-dimensional appearance. The largest droplet is in the top left, and another large one is in the bottom right. There are also many smaller droplets of different shapes and sizes.

Wipe Out

Session 2: Cellular Processes

Cell organelles carry out specific metabolic processes.

1. Study the statement above. Which cell organelle manages the process by which **proteins are sorted and packaged** to be sent where they are needed?

a. ribosomes

c. Golgi bodies

b. lysosomes

d. vacuoles

Cell organelles carry out specific metabolic processes.

2. Study the statement above. Which cell organelle is responsible for **storing enzymes and other materials** needed by the cell?

a. ribosomes

c. mitochondria

b. vacuoles

d. lysosomes

Cell organelles carry out specific metabolic processes.

3. Study the statement above. Which cell organelle manages the process by which **proteins are assembled** based on DNA instructions?

a. mitochondria

b. lysosomes

c. ribosomes

d. vacuoles

Cell organelles carry out specific metabolic processes.

4. Study the statement above. Which cell organelle manages the process by which **energy stored in food molecules is transformed into usable energy** for the cell?

a. lysosomes

c. mitochondria

b. golgi bodies

d. ribosomes

Cell organelles carry out specific metabolic processes.

5. Study the statement above. Which cell organelle manages the process by which **worn out organelles, food particles, and engulfed viruses or bacteria are digested?**

a. ribosomes

c. vacuoles

b. lysosomes

d. golgi bodies

6. Which of these is **not** an advantage gained by organisms which **reproduce sexually**?

a. Genetic recombination created genetic diversity within a species.

b. Some percentage of organisms within a species will be likely to survive and reproduce despite harsh environmental conditions.

c. Genetic diversity reduces the risk of species extinction caused by hard environmental conditions.

d. Genetic diversity weakens a species' overall ability to survive harsh environmental conditions.

7. A **fertilized egg** created through **sexual reproduction**-

a. has a combination of genetic material that is unique in the species

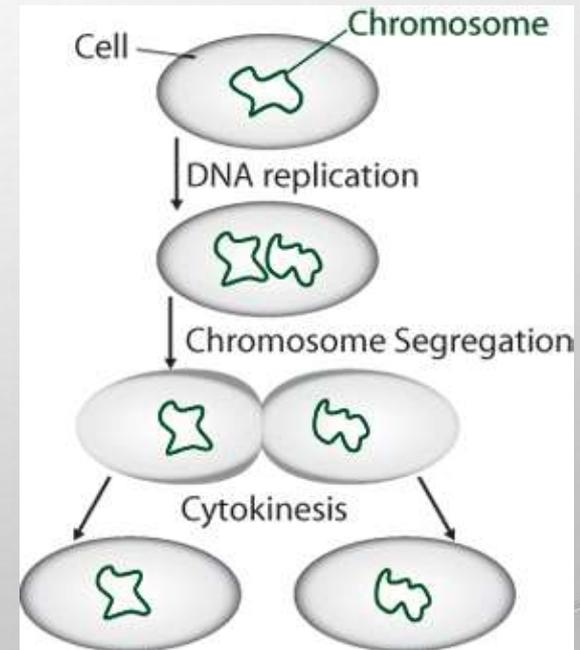
b. is genetically identical to other eggs of the same parents

c. is genetically identical to the parents

d. contains genetic material from only one parent

8. Organisms reproduce asexually in a variety of ways. A **bacterium** reproduces by making a **copy of its chromosome**, growing larger, then **dividing into two separate**, genetically identical cells. This process is called-

- a. regeneration
- b. binary fission
- c. vegetative reproduction
- d. budding



9. Which of the following statements about **sexual reproduction** is **false**?

a. Organisms that reproduce sexually produce sex cells called gametes.

b. Fertilization is part of the sexual reproduction process.

c. In sexual reproduction, a single parent produces identical offspring.

d. A zygote is produced through sexual reproduction.

10. Study the chemical reactions below.

Photosynthesis:

Cellular respiration:

(glucose and oxygen → carbon dioxide and water and energy)

Plants produce **more oxygen** during **photosynthesis** than they use in cellular respiration. What happens to the **excess oxygen** produced during photosynthesis?

- a. It is used as an energy source by plant cells.
- b. It is released into the air and is used by other organisms for respiration.
- c. It is converted into heat energy.
- d. It is a waste product which is never reused.

11. Which of these is **inhaled by animals**, then **used in respiration**?

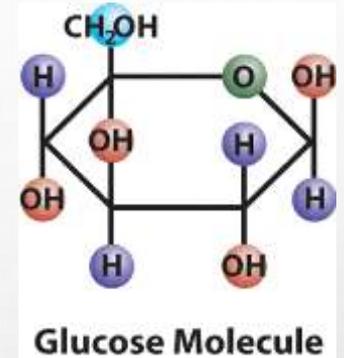
a. carbon

b. oxygen

c. nitrogen

d. water

12. One of the products of photosynthesis is **glucose** ($C_6H_{12}O_6$). Which of the following statements about the **production** and **use** of this molecule is **false**?



- a. Plants use the energy from glucose to convert nutrients to body tissues and grow larger.
- b. Glucose that is not immediately used by the plant is stored for later use.
- c. Plants use the energy from glucose to manufacture a variety of plant products.
- d. Glucose that is not immediately used by the plant is lost as waste material.

13. Tigers, goldfish, peacocks, and humans all **reproduce sexually**. Which statement is **true** about **sexual reproduction**?

a. It is not a factor scientists use to define different species.

b. It involves the joining of an egg and sperm into one cell.

c. The offspring are genetically the same as their parents.

d. Sexual reproduction can only take place by internal fertilization.

14. Jackson is growing a bean plant in a pot. One day Jackson notices that the plant is wilting. He waters the bean plant and within a few minutes the plant begins to perk up. This is because the plant has taken up water by osmosis. At what **structural level** does **osmosis** occur?

a. organs

b. tissues

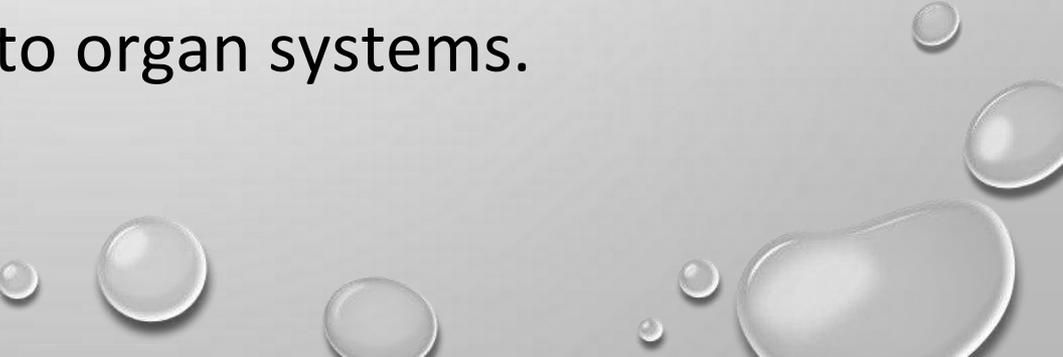
c. cells

d. organ systems

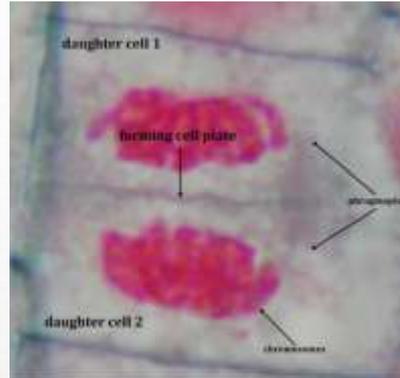


Organisms as different as bacteria, mushrooms, algae, oak trees, and human beings are all made of cells.

15. Read the information above. Which statement is **true** for all cells?

- a. All cells have the same shape.
 - b. All cells need energy to survive.
 - c. All cells are surrounded by a rigid wall.
 - d. All cells belong to organ systems.
- 

Michelle is looking through a microscope at a cell from an onion root. She sees a cell that is in the process of dividing to make a new cell. This is what Michelle sees:



16. Study the diagram and the description above. If Michelle were able to find an **onion cell** that had **completed division**, what **products of cell division** would she see?

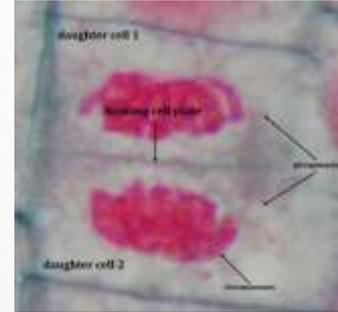
a. four different cells

b. only one cell

c. two identical cells

d. four identical cells

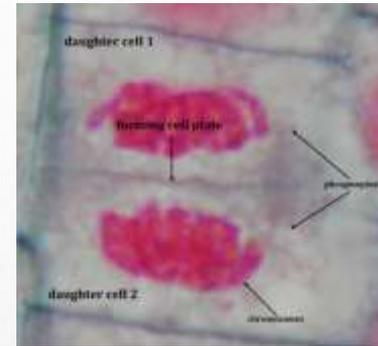
Michelle is looking through a microscope at a cell from an onion root. She sees a cell that is in the process of dividing to make a new cell. This is what Michelle sees:



17. Study the diagram and the statement above. Michelle is observing cell division in an onion cell, but this type of cell division also occurs in the human body. Which statement is ***not true*** about this type of **cell division in humans**?

- a. This type of cell division in humans produces sex cells as well as body cells.
- b. This type of cell division in humans occurs while bones are forming during development.
- c. This type of cell division in humans can be affected by viruses.
- d. This type of cell division in humans is necessary to heal cuts and wounds

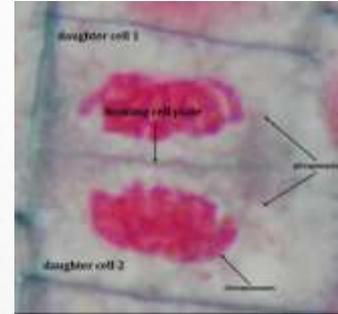
Michelle is looking through a microscope at a cell from an onion root. She sees a cell that is in the process of dividing to make a new cell. This is what Michelle sees:



18. Study the diagram and the description above. What is the name for the **process** Michelle is observing?

- a. mutation
- b. meiosis
- c. mitosis
- d. metamorphosis

Michelle is looking through a microscope at a cell from an onion root. She sees a cell that is in the process of dividing to make a new cell. This is what Michelle sees:



19. Study the diagram and the information above. Which of these statements about **cell division** is true?

a. A newly formed daughter cell has less DNA than its parent cell.

b. Cells divide at random times.

c. New cells formed by cell division can replace dying cells in an organism.

d. The phases of cell division can occur in any order.

20. A special type of cell division, called **meiosis**, is used to form **sex cells or gametes**. Which statement is ***true*** about this type of **cell division**?

a. The products of meiosis are two identical cells.

b. DNA is not copied at all during meiosis.

c. The new cells have half the DNA of the parent cell.

d. Meiosis is complete after only one round of cell division.

21. A person with swollen gums rinses his mouth with **warm salt water**, and the **swelling decreases**. Which has occurred?

a. The swollen gums have absorbed the saltwater solution.

b. The saltwater solution lowers the temperature of the water in the gums.

c. The salt in the solution has moved against the concentration gradient.

d. The water in the gums has moved from a high to a low concentration of water.

22. What ***advantage*** do **sexually reproducing** organisms have over asexually reproducing organisms?

a. genetic variation

b. genetic stability

c. increased fertilization rate

d. increased reproductive rate

23. What is the **most likely function** of a group of cells that contain a **high number of chloroplasts**?

a. respiration

b. transpiration

c. fermentation

d. photosynthesis

24. In humans, **glucose** is kept *in balance* in the bloodstream by **insulin**. Which concept does this best illustrate?

- a. adaptation
- c. metabolism

- b. homeostasis
- d. organization

25. In which way are **photosynthesis** and **cellular respiration** *different*?

- a. Cellular respiration stores ATP, while photosynthesis releases ATP.
- b. Cellular respiration produces oxygen, while photosynthesis uses oxygen.
- c. Photosynthesis releases energy, while cellular respiration stores energy.
- d. Photosynthesis uses carbon dioxide, while cellular respiration produces carbon dioxide.

26. Which statement best *distinguishes* aerobic from anaerobic respiration?

- a. Only aerobic respiration involves fermentation.
- b. Only anaerobic respiration occurs in the mitochondria.
- c. Only aerobic respiration requires oxygen.
- d. Only anaerobic respiration produces carbon dioxide.

27. Which most accurately describes the *difference* in **ATP production** between **aerobic respiration** and **anaerobic respiration**?

a. Aerobic respiration produces more ATP than anaerobic respiration.

b. Anaerobic respiration produces more ATP than aerobic respiration.

c. Only anaerobic respiration produces measurable amounts of ATP.

d. Anaerobic and aerobic respiration produce the same amount of ATP.

28. A human **skin cell** contains **46 chromosomes**. How many **chromosomes** are present in a **human sperm cell**?

a. 23

b. 46

c. 92

d. 138

29. What is **homeostasis**?

a. the ability of an organism to maintain a relatively stable internal environment

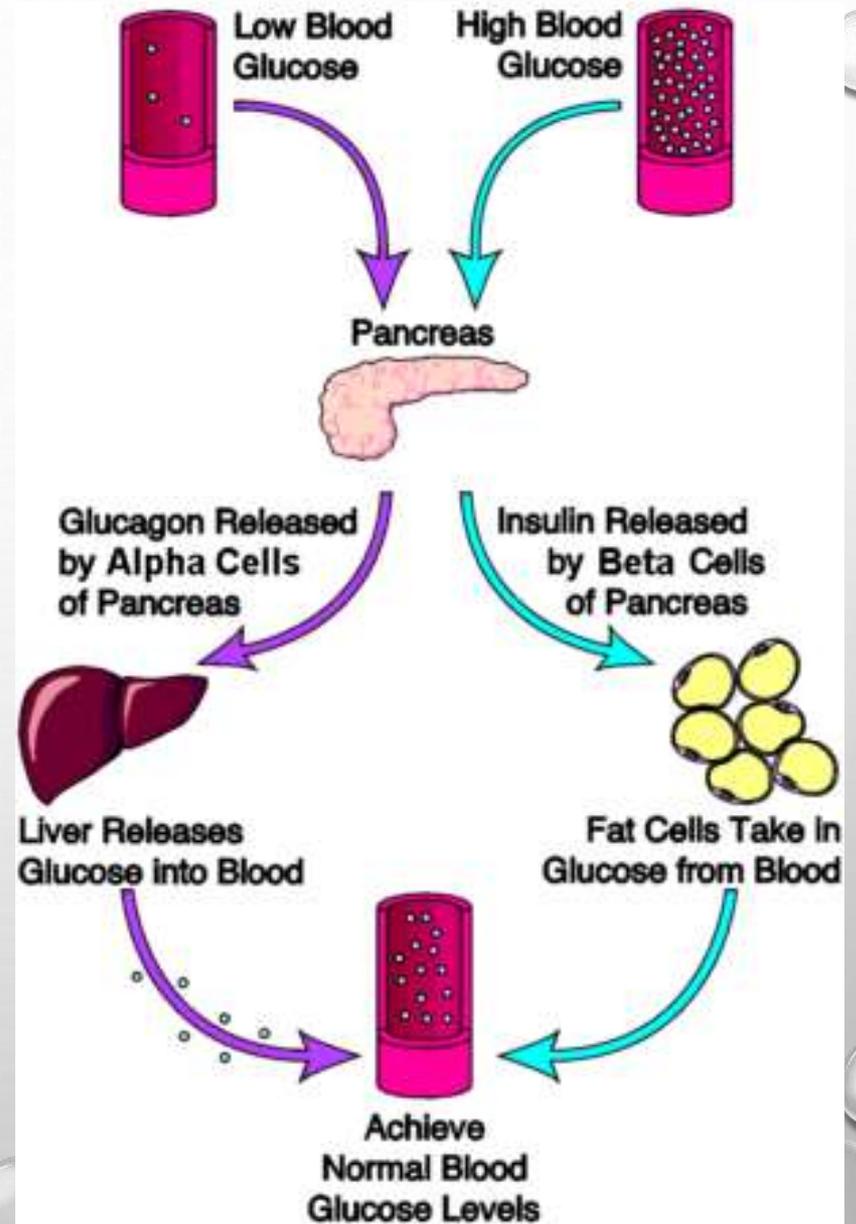
b. the production of a hormone by an endocrine gland that works on another endocrine gland

c. a series of events that monitor how hormones work in the body

d. a process in which a change in the environment causes a response that returns conditions to their original status

30. If the body **stopped producing new Beta cells**, what would the expected outcome be?

- a. The pancreas would no longer release glucagon
- b. High blood glucose levels would continue to become normal
- c. Insulin would no longer be released
- d. Alpha cells would become beta cells



31. You just ran a marathon (26.2 miles) and your body is trying to reach **homeostasis**. Which of the following statements is **true**?

- a. Your blood vessels will constrict to conserve heat
- b. Your blood vessels will dilate to release body heat
- c. Your body's control center will shut down
- d. Your brain will tell your body not to sweat