

Key

Inside the nucleus

- 23
- 46
- chromosomes
- DNA
- genes
- genetic
- molecule
- nucleolus
- nucleus
- number
- proteins
- ribosomes
- type

Use the terms in the vocabulary box to fill in the blanks. Each term may be used more than once. You will not need to use every term.

- The nucleus directs and controls the ability of the cell to grow, develop, and replicate (make copies of itself).
- The instructions for how to carry out all cell activities are carried in DNA, which is a long, two-stranded with a shape like a ladder that has been twisted into a spiral shape.
- DNA genes stores instructions for everything that the cell does. It also stores genetic material—information that is passed on from one generation to another when organisms reproduce.
- Strands of DNA are packaged tightly into structures called chromosomes.
- Each type of organism has a specific number of chromosomes.
- Humans have 46 chromosomes that are arranged in 23 pairs. One of these pairs helps determine if a person will be born as a male or a female.

- genes are small segments of DNA that carry instructions for making proteins. They are found at specific places on chromosomes.
- Proteins are a type of molecule that all the cells of the body need in order to work properly.
- Proteins are made in the cell by ribosomes, which are made by a large structure in the nucleus called the nucleolus.

- * nucleotides
- * rna
- * amino acids

The Effects of Mutations

- DNA
- gene mutation
- gene therapy
- healthy gene
- mutagens
- mutated gene
- negative mutations
- neutral mutations
- organism
- positive mutations
- proteins

Use the terms in the vocabulary box to fill in the blanks. You will not need to use every term. You may use terms more than once.

- A mutation is a change in the genetic material of a gene.
- Changes to DNA may cause proteins to be made incorrectly or with an incorrect shape.
- Factors in the environment, called mutagens can cause mutations.
- Radiation, cigarette smoke, and pesticides are examples of * Carcinogens
- Mutations that are harmful to an organism are called negative mutations
- Mutations that are helpful to an organism are called Positive mutations. For instance, some plants carry a mutated gene that protects them from disease.
- Mutations that have no effect on an organism are called neutral mutat.
- New techniques for treating gene mutations are called gene therapy and may involve replacing a mutated gene with a healthy gene.

The Cell Cycle

anaphase
cell cycle
cytokinesis
DNA
duplicated chromosomes
four
interphase
metaphase

mitosis
nucleolus
nucleus
prophase
telophase
three
two

Use the terms in the vocabulary box to fill in the blanks. You can use each term more than once. You will not need to use every term.

1. There are three stages in the life of a cell.
2. The stage that makes up most of the cell's life is interphase.
During this stage, cells grow and carry out their life functions. In cells that will divide, the nucleus makes a copy of its DNA.
3. During mitosis, the nucleus of the cell divides into two equal and identical parts. Each part has a copy of the DNA.
4. During cytokinesis, the two equal, identical parts of the cell separate. This stage forms two identical cells with a nucleus and DNA.
5. There are four phases of mitosis.
6. In prophase, the duplicated chromosomes contract into an X shape and the nuclear memb. disappears.
7. In metaphase, the dup. chromosomes line up across the middle of the cell.
8. In anaphase, the chromosomes move apart to opposite ends of the cell.
9. In telophase, a nuclear memb. forms around the chromosomes at the opposite ends of the dividing cell.

Asexual Reproduction

asexual reproduction
binary fission
budding
clone
cuttings
DNA

fragmentation
grafts
spore formation
stem cells
vegetative reproduction

Use the terms in the vocabulary box to fill in the blanks. You can use each term more than once. You will not need to use every term.

1. A clone is an identical genetic copy of its parent.
2. In asexual rep, only one parent is required to produce offspring.
3. binary fission is a method of reproduction for some types of bacteria.
4. Some simple organisms, such as hydras and sponges, are able to reproduce asexually by budding.
5. Certain species of sea stars, corals, and mosses can reproduce asexually by fragmentation.
6. veg. reproduction occurs when special cells in the stems and roots divide repeatedly to form structures that eventually develop into a plant identical to the parent.
7. Some bacteria can reproduce asexually when their single cells split in two, forming new individuals in a process called binary fission.
8. stem cells are cells that have the potential to become many different types of cells.

Chapter 2 Quiz

Part A: Modified True/False

Indicate whether each statement is true or false. If false, change the underlined word or phrase to make the statement true.

- F 1. Multicellular organisms grow by increasing the size of their cells. #
- F 2. Instructions for all cell activities are coded for by proteins. dna
- T 3. The stage of the cell cycle in which a cell is not actively dividing is known as interphase.
- F 4. A change in a cell's genes is known as a cancer. mutation.
- T 5. A cancer tumour that does not interfere with the cells around it is known as a benign tumour.

Part B: Completion

Complete the following sentences.

6. If one cell undergoes division and continues to do so for five divisions, there will be 32 cells.
7. The part of the cell that contains all of the materials needed to make ribosomes is known as the nucleolus.
8. A chemical substance that can cause cancer is known as a carcinogen.
9. A cancerous tumour may spread to other parts of the body by the process of metastasis.

Part C: Matching

Match each of these words to their correct description.

- | | |
|---------------------------|--|
| <u>c</u> 10. chromosomes | (a) provide energy for the cell |
| <u>a</u> 11. mitochondria | (b) location of most cell activity including absorbing, moving, and processing materials |
| <u>d</u> 12. ribosomes | (c) contain genes |
| <u>b</u> 13. cytoplasm | (d) produce proteins |

Chapter 2 Quiz (continued)

Part D: Multiple Choice

Circle the letter beside the answer that best completes the statement or answers the question.

14. Cell division is used for
- (a) reproduction
 - (b) growth
 - (c) repair
 - (d) all of the above
15. Mitosis proceeds through a series of stages. These, in order, are
- (a) interphase, metaphase, prophase, telophase
 - (b) prophase, metaphase, anaphase, telophase
 - (c) prophase, anaphase, metaphase, telophase
 - (d) metaphase, telekinesis, prophase, cytokinesis
16. The stage of mitosis during which the cytoplasm is divided into two parts is called
- (a) cytokinesis
 - (b) telophase
 - (c) interphase
 - (d) binary fission
17. Some animals are able to replace lost limbs or other body parts. This ability is called
- (a) fragmentation
 - (b) vegetative reproduction
 - (c) budding
 - (d) regeneration
18. Which of the following statements about DNA is **not** true?
- (a) The DNA molecule can make a copy of itself.
 - (b) The DNA molecule looks like a twisted ladder (double helix).
 - (c) In DNA, adenine is always paired with guanine.
 - (d) There are only four nitrogenous bases available to form DNA.

Part E: Short Answer

Use sentences to answer the following questions.

19. At some time in your life, you cut yourself on a piece of glass or some other sharp object. In one or two sentences, explain why that cut is no longer bleeding, and the role of cell division in the process of healing.

blood clots, cells divide to repair cut.

20. Explain what fragmentation is. Name one organism that can reproduce via fragmentation with regeneration.

Sea Star. A piece can break off and grow into a new organism