

Most enzymes are categorized by which type of macromolecule?

- A) Carbohydrates
- B) Lipids
- C) Nucleic acids
- D) **Proteins**

The specific region on an enzyme where the substrate binds and catalysis occurs is known as the:

- A) Allosteric site
- B) Regulatory site
- C) **Active site**
- D) Inhibitor site

Enzymes are highly sensitive to changes in environmental conditions, particularly:

- A) Light intensity and atmospheric pressure.
- B) **Temperature and pH.**
- C) Humidity and gravitational force.
- D) Substrate concentration and product concentration.



Which of the following organelles is primarily responsible for photosynthesis in plant cells?

- A) Mitochondria
- B) Ribosomes
- C) **Chloroplasts**
- D) Endoplasmic Reticulum

A rigid outer layer found in plant cells but absent in animal cells is the:

- A) Plasma membrane
- B) **Cell wall**
- C) Cytoplasm
- D) Nuclear envelope

Which of these structures is typically much larger and more prominent in mature plant cells compared to animal cells?

- A) Nucleus
- B) **Vacuole**
- C) Golgi apparatus
- D) Lysosome



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- A) Carbon dioxide
- B) Nitrogen
- C) Oxygen
- D) Methane

What is the role of ATP in biological systems as described in the context of bioenergetics?

- A) It is a structural component of cell membranes.
- B) It acts as a chemical link between catabolism and anabolism.
- C) It is a primary genetic material.
- D) It functions as an enzyme in metabolic reactions.

Which of the following processes releases a great deal of energy and couples some of this energy to ATP formation?

- A) Photosynthesis
- B) Transpiration
- C) Respiration
- D) Active transport



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What percentage of the human body is constituted by the six major bioelements?

- A) 50%
- B) 75%
- C) 99%
- D) 100%

Which of the following is considered a 'major bioelement' in the human body?

- A) Potassium
- B) Sulphur
- C) Calcium
- D) Iron

What distinguishes minor bioelements from major bioelements?

- A) Minor bioelements are found in proportions less than '0.01%' of protoplasm.
- B) Minor bioelements are not essential for life.
- C) Minor bioelements are found as less than '1%' of the protoplasm.
- D) Minor bioelements are only



According to evolutionists, approximately how long ago did life begin on Earth?

- A) About 1.5 billion years ago
- B) **About 3.5 billion years ago**
- C) About 5 billion years ago
- D) About 420 million years ago

What was the likely atmospheric condition of early Earth, according to evolutionists?

- A) Oxidizing and hot
- B) Reduced and oxygen-rich
- C) **Reduced and ozone-less**
- D) Oxidizing and ozone-rich

The hypothesis suggesting that the first living beings originated in hot water springs among inorganic and organic molecules is called the:

- A) Panspermia hypothesis
- B) Biochemical evolution hypothesis
- C) **Vent hypothesis**
- D) Spontaneous generation



Which of the following is NOT a characteristic of cellular respiration?

- A) It is a catabolic process.
- B) It occurs at the cellular level.
- C) It involves the inhaling of oxygen.
- D) It releases energy.

Which property is essential for a respiratory surface to allow effective gas diffusion?

- A) It must be thick.
- B) It must be dry.
- C) It must be permeable.
- D) It must have a small surface area.

Why must a respiratory surface be thin for efficient diffusion?

- A) To increase its surface area.
- B) Diffusion is only efficient over short distances.
- C) To prevent water loss.
- D) To ensure a good blood supply.



A single cell undergoes meiosis. How many daughter cells are produced, and what is their ploidy level?

- A) Two diploid cells.
- B) Four diploid cells.
- C) Two haploid cells.
- D) **Four haploid cells.**

Which of the following events characterizes Prophase I of meiosis?

- A) Sister chromatids separate.
- B) Chromosome pairs line up at the equator.
- C) **Homologous chromosomes pair up and may exchange DNA.**
- D) DNA is copied.

During which stage of meiosis do homologous chromosome pairs align at the center of the cell?

- A) Prophase I
- B) **Metaphase I**
- C) Anaphase I
- D) Telophase I



Which of the following elements is classified as a macronutrient required by plants?

- A) Zinc
- B) Molybdenum
- C) Potassium
- D) Boron

The technique most useful for determining if an element is essential for plant growth is:

- A) Soil analysis
- B) Foliar application
- C) Hydroponics
- D) Crop rotation

A plant showing stunted growth and purplish discoloration of leaves, particularly older ones, is likely deficient in:

- A) Nitrogen
- B) Phosphorus
- C) Iron
- D) Magnesium



Which micronutrient is essential for chlorophyll synthesis but is not a constituent of the chlorophyll molecule itself?

- A) Magnesium
- B) **Iron**
- C) Manganese
- D) Copper

Carnivorous plants, like the pitcher plant, primarily obtain which nutrient from consuming insects?

- A) Carbon
- B) Oxygen
- C) **Nitrogen**
- D) Water

Which of these is a typical characteristic of a plant suffering from nitrogen deficiency?

- A) Yellowing of younger leaves
- B) Necrosis of leaf margins
- C) **Yellowing of older leaves**
- D) Deep green coloration of all leaves



Which of the following best describes the primary need for support in living organisms?

- A) To enhance sensory perception.
- B) To resist gravity and external forces.
- C) To facilitate reproduction.
- D) To regulate internal temperature.

What was a significant evolutionary development that increased the need for greater support in living organisms?

- A) The transition from unicellular to multicellular forms.
- B) The increase in size of organisms.
- C) The development of photosynthesis.
- D) The shift from asexual to sexual reproduction.



What is the scientific study of bones

What is the scientific study of bones and cartilage called?

- A) Myology
- B) Histology
- C) **Osteology**
- D) Neurology

An individual bone is composed of a variety of tissues. Which of the following is NOT typically found in an individual bone?

- A) Bone tissue
- B) Cartilage
- C) **Muscle tissue**
- D) Nerve tissue

In a long bone, the broad terminal parts are called the:

- A) Diaphysis
- B) Periosteum
- C) **Epiphysis**
- D) Endosteum



Which part of a long bone is also

Which part of a long bone is also known as the shaft and contains a central cavity filled with yellow bone marrow?

- A) Epiphysis
- B) **Diaphysis**
- C) Periosteum
- D) Spongy bone

The outer connective tissue layer around a bone is known as the:

- A) Endosteum
- B) **Periosteum**
- C) Compact bone
- D) Spongy bone

Which of the following bone structures primarily contains red bone marrow in its spaces?

- A) Compact bone
- B) Periosteum
- C) **Spongy bone**
- D) Yellow bone marrow



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What is the primary function of osteoblasts?

- A) To destroy bone tissue.
- B) To maintain healthy bone tissue.
- C) To synthesize and secrete unmineralized ground substance.
- D) To regulate calcium release to blood.

What do osteoblasts become once they are surrounded by the bone matrix?

- A) Osteoclasts
- B) Chondrocytes
- C) Osteocytes
- D) Fibroblasts

What is a key function of osteocytes in healthy bone tissue?

- A) Breaking down bone for calcium release.
- B) Synthesizing new bone matrix.
- C) Secreting enzymes and influencing bone mineral content.
- D) Forming cartilage.



Which type of bone cell is responsible for bone resorption?

- A) Osteoblasts
- B) Osteocytes
- C) **Osteoclasts**
- D) Chondrocytes

The work of osteoclasts is important for which of the following processes?

- A) Cartilage formation.
- B) Muscle contraction.
- C) **Bone growth and repair.**
- D) Nerve tissue development.

How does cartilage compare to bone in terms of strength?

- A) Cartilage is stronger than bone.
- B) Cartilage is as strong as bone.
- C) **Cartilage is not as strong as bone.**
- D) Strength comparison varies greatly by type.



The flexibility of cartilage is primarily

The flexibility of cartilage is primarily due to its matrix being:

- A) Densely packed with minerals.
- B) Composed of dead cells.
- C) **Containing collagenous and elastic fibers.**
- D) Highly vascularized.

What is the dense layer of collagen fibers covering the cartilage matrix called?

- A) Periosteum
- B) Endosteum
- C) **Perichondrium**
- D) Lacunae

The living cells of cartilage are known as:

- A) Osteocytes
- B) Osteoblasts
- C) **Chondrocytes**
- D) Fibrocytes



How do chondrocytes primarily receive their nutrient supply?

- A) Through direct blood vessels.
- B) **By diffusion.**
- C) Via nerve tissue.
- D) Through direct contact with bone.

Why does cartilage heal very slowly?

- A) It lacks nerve tissue.
- B) It has a very rigid matrix.
- C) **It lacks blood vessels.**
- D) It is constantly under pressure.

Which type of cartilage is found at the ends of long bones, in the nose, larynx, and trachea?

- A) Fibrocartilage
- B) Elastic cartilage
- C) **Hyaline cartilage**
- D) Reticular cartilage