

Essentials of Genetics, 10e (Klug)
Chapter 1 Introduction to Genetics

1) The CRISPR-Cas system potentially represents one of the most power techniques in genetics as a result of its role in _____ associated with specific human disorders.

- A) identifying genes
- B) editing genes
- C) producing new genes
- D) regulating genes
- E) transmitting genes

Answer: B

Section: Introduction

Bloom's Taxonomy: Remembering/Understanding

2) In the 1600s, William Harvey studied reproduction and development. What is the term given to his theory which states that an organism develops from the fertilized egg by a succession of developmental events that lead to an adult?

- A) preformation
- B) spontaneous generation
- C) cell theory
- D) transduction
- E) epigenesis

Answer: E

Section: 1.1

Bloom's Taxonomy: Remembering/Understanding

3) What is the term given to the theory which states that the gamete contains a complete miniature adult?

- A) preformation
- B) transduction
- C) transformation
- D) conjugation
- E) cell theory

Answer: A

Section: 1.1

Bloom's Taxonomy: Remembering/Understanding

4) What is the term given to the theory which put forth the idea that living organisms could arise by incubating nonliving components?

- A) spontaneous generation
- B) natural selection
- C) evolution
- D) preformation
- E) collective combination

Answer: A

Section: 1.1

Bloom's Taxonomy: Remembering/Understanding

5) Schleiden and Schwann proposed the cell theory which states that _____.

- A) cells contain genetic information in their nucleus
- B) cells move from the various parts of the body to the reproductive organs to produce offspring
- C) cells are derived from preexisting cells
- D) cells propagate via asexual reproduction
- E) cells represent the basic units of heredity

Answer: C

Section: 1.1

Bloom's Taxonomy: Remembering/Understanding

6) Who, along with Alfred Wallace, formulated the theory of natural selection?

- A) Gregor Mendel
- B) William Harvey
- C) Louis Pasteur
- D) Charles Darwin
- E) James Watson

Answer: D

Section: 1.1

Bloom's Taxonomy: Remembering/Understanding

7) Which of the following is an example of natural selection?

- A) a bird's beak is able to effectively crack the seeds it encounters
- B) dog breeding by humans
- C) depending on the food a turtle eats, its shell may grow faster or slower
- D) sometime during human's life they break a bone
- E) bacteria can be effectively killed by treatment with bleach

Answer: A

Section: 1.1

Bloom's Taxonomy: Evaluating/Creating

8) Which of the following botanists was not involved with bringing Mendel's work to light in the 1900s?

- A) Carl Correns
- B) Carl Linnaeus
- C) Hugo de Vries
- D) Erich Tschermak

Answer: A

Section: 1.1

Bloom's Taxonomy: Remembering/Understanding

9) Who was the Augustinian monk that conducted a decade of experiments on the garden pea, eventually showing that traits are passed from parents to offspring in predictable ways?

- A) Francis Crick
- B) Alfred Wallace
- C) Hippocrates
- D) Aristotle
- E) Gregor Mendel

Answer: E

Section: 1.2

Bloom's Taxonomy: Remembering/Understanding

10) In many species, there are two representatives of each chromosome. In such species, the characteristic number of chromosomes is called the _____ number. It is usually symbolized as _____.

- A) haploid; n
- B) haploid; $2n$
- C) diploid; $2n$
- D) diploid; n
- E) polyploid; n

Answer: C

Section: 1.2

Bloom's Taxonomy: Remembering/Understanding

11) Genetics is defined as the branch of biology associated with _____.

- A) heredity and variation
- B) mutation and recession
- C) transcription and translation
- D) diploid and haploid
- E) replication and recombination

Answer: A

Section: 1.2

Bloom's Taxonomy: Remembering/Understanding

12) Early in the twentieth century, Walter Sutton and Theodor Boveri noted that the behavior of chromosomes during meiosis is identical to the behavior of genes during gamete formation. They proposed that genes are carried on chromosomes, which led to the basis _____.

- A) of the germ-plasm theory
- B) of the chromosome theory of inheritance
- C) of the law of independent assortment
- D) for the determination of DNA as genetic material
- E) of predicting patterns of inheritance

Answer: B

Section: 1.2

Bloom's Taxonomy: Remembering/Understanding

13) What is a simple definition of an allele?

Answer: An allele is an alternative form of a gene.

Section: 1.2

Bloom's Taxonomy: Remembering/Understanding

14) The observable feature of an organism is referred to as a _____.

- A) genotype
- B) phenotype
- C) prototype
- D) karyotype
- E) bryophyte

Answer: B

Section: 1.2

Bloom's Taxonomy: Remembering/Understanding

15) Until the mid-1940s, many scientists considered proteins to be the likely candidates for the genetic material. Which of the following characteristics led scientists to believe DNA was NOT the genetic material?

- A) DNA is more stable than protein.
- B) DNA is less abundant than protein.
- C) DNA has less variation than protein.
- D) Protein can fold into many shapes.
- E) DNA is less abundant than protein and DNA has less variation than protein.

Answer: E

Section: 1.2

Bloom's Taxonomy: Applying/Analyzing

16) Which of the following is an example of heredity?

- A) A man has low blood pressure due to medications.
- B) Both moths and birds have wings and can fly.
- C) Dalmation dogs all have spots.
- D) Whales and fish both swim.
- E) Flies and molluscs both have eyes.

Answer: C

Section: 1.2

Bloom's Taxonomy: Evaluating/Creating

17) Which is not a component of DNA?

- A) mRNA
- B) deoxyribose sugar
- C) nitrogenous base
- D) phosphate

Answer: A

Section: 1.3

Bloom's Taxonomy: Remembering/Understanding

18) Distinguish the functions of DNA and RNA in a eukaryote.

Answer: DNA is responsible for the storage and replication of genetic information; RNA is involved in the expression of stored genetic information.

Section: 1.3

Bloom's Taxonomy: Applying/Analyzing

19) Genetic information contained in DNA that encodes for an amino acid is referred to as a(n)

- _____.
- A) allele
 - B) trait
 - C) nucleotide
 - D) codon
 - E) genotype

Answer: D

Section: 1.3

Bloom's Taxonomy: Remembering/Understanding

20) Which of the following processes describes the formation of a complementary RNA molecule?

- A) replication
- B) transcription
- C) translation
- D) mutation
- E) mosaicism

Answer: B

Section: 1.3

Bloom's Taxonomy: Remembering/Understanding

21) Reference is often made to *adapter molecules* when describing protein synthesis in that they allow amino acids to associate with nucleic acids. To what class of molecules does this term refer?

- A) DNA
- B) protein
- C) mRNA
- D) amino acids
- E) tRNA

Answer: E

Section: 1.3

Bloom's Taxonomy: Remembering/Understanding

22) If a scientist changed a cell's ionic composition and complementarity between DNA strands could no longer occur, what would the scientist first detect?

- A) DNA becomes single stranded
- B) DNA strands become shorter
- C) RNA would start binding to DNA
- D) ribosomes would move into the nucleus
- E) cell membranes would become less permeable

Answer: A

Section: 1.3

Bloom's Taxonomy: Evaluating/Creating

23) Sickle-cell anemia, which is associated with blockage of blood flow in capillaries and small blood vessels, causing severe pain and damage to the heart, brain, muscles, and kidneys is the result of _____.

- A) a large chromosome deletion
- B) a small chromosome deletion
- C) a change in a single nucleotide
- D) an environmental pathogen
- E) a hormonal variation

Answer: C

Section: 1.3

Bloom's Taxonomy: Remembering/Understanding

24) Which of the following contains all the others?

- A) double helix
- B) nucleotide
- C) hydrogen bond
- D) DNA strand
- E) sugar

Answer: A

Section: 1.3

Bloom's Taxonomy: Applying/Analyzing

25) Once a protein is made, its biochemical or structural properties play a role in producing _____.

- A) genotype
- B) phenotype
- C) mutant
- D) chromosome
- E) DNA

Answer: B

Section: 1.3

Bloom's Taxonomy: Applying/Analyzing

26) A primary discovery to generate recombinant DNA molecules was the use of _____.

- A) spliceosomes
- B) restriction enzymes
- C) microscopes
- D) bioinformatics
- E) x-ray diffraction

Answer: B

Section: 1.4

Bloom's Taxonomy: Remembering/Understanding

27) A _____ is an organism produced by biotechnology that involves the transfer of hereditary traits across species.

- A) transgenic organism
- B) mutant
- C) clone
- D) vector
- E) frankenfood

Answer: A

Section: 1.5

Bloom's Taxonomy: Remembering/Understanding

28) The study of the structure, function, and evolution of genes and genomes is referred to as _____.

- A) genomics
- B) proteomics
- C) bioinformatics
- D) genetics
- E) cell theory

Answer: A

Section: 1.6

Bloom's Taxonomy: Remembering/Understanding

29) _____ is a discipline involved in the development of both hardware and software for processing, storing, and retrieving nucleotide and protein data.

- A) Bioinformatics
- B) Genomics
- C) Recombinant DNA technology
- D) Cloning
- E) Proteomics

Answer: A

Section: 1.6

Bloom's Taxonomy: Remembering/Understanding

30) There are various technologies to knock out genes in organisms, what is the primary rationale for performing these experiments?

Answer: To determine the function of the gene based on changes in phenotype

Section: 1.6

Bloom's Taxonomy: Applying/Analyzing

31) Organisms that are well understood from a scientific standpoint and are often used in basic biological research are often called _____.

A) clones

B) vectors

C) recombinant DNA technology

D) model organisms

E) restriction enzymes

Answer: D

Section: 1.7

Bloom's Taxonomy: Remembering/Understanding

32) The most accurate depiction of the chronological order of genetic discoveries would be _____.

A) chromosome theory of inheritance, Mendelian genetics, recombinant DNA technology, determination of DNA structure

B) determination of DNA structure, chromosome theory of inheritance, Mendelian genetics, recombinant DNA technology

C) Mendelian genetics, chromosome theory of inheritance, determination of DNA structure, recombinant DNA technology

D) Mendelian genetics, determination of DNA structure, chromosome theory of inheritance, recombinant DNA technology

Answer: C

Section: 1.8

Bloom's Taxonomy: Remembering/Understanding