

DNA is the inherited material responsible for variation

Student Name _____

Class _____

DNA – Transmitter of Genetic Code

1. Scientists researched and studied the genetic code that is passed on from parent to offspring from generation to generation. By knowing what makes up this genetic code, scientists are able to be more selective in what is passed on from parent to offspring during the breeding process. The **genetic code** is the ...
 - A. illustration
 - B. blueprint
 - C. species-plan
 - D. specification

2. The inherited material that is responsible for variation in all organisms is **DNA**, which stands for ...
 - A. donornucleic acid
 - B. delicate nucleus assist
 - C. denitro acetaminaphen
 - D. deoxyribonucleic acid

3. All living cells contain DNA. In the cells of plants and mammals, **DNA** is located in the ...
 - A. cytoplasm
 - B. nucleus
 - C. vacuoles
 - D. mitochondria

4. **DNA** was first identified in 1969. In 1944 Canadian scientist Oswald Avery confirmed that the **DNA** was the material of ...
 - A. inheritance
 - B. variation
 - C. restructure
 - D. character

5. To solve the structural questions that **DNA** posed, two scientists revealed that the same chemical building blocks could carry a wide range of instructions needed for diversity. The scientists were ...
 - A. Emery and Avery
 - B. Avery and Crick
 - C. Watson and Holmes
 - D. Crick and Watson

6. Paired chemicals make up the '**rungs**' of the '**spiral ladder**' that represents the model of **DNA**. The four chemicals that are paired in different combinations, making up the 'rungs', are ...
 - A. cytosine, adenine, thymine, guanine
 - B. cryptosine, adenine, thalamine, guanine
 - C. cytosine, adonine, thalamine, quanine
 - D. cryptosine, adonine, thymine, quanine

7. The varied arrangement of the four chemicals forms the code that the cell can read. Each pairing along the ladder provides specific instructions for making each unique individual. The **DNA** in each cell is arranged in packages known as ...
 - A. globules
 - B. chromosomes
 - C. nuclei
 - D. helical

8. In organisms such as plants and animals, the **chromosomes** are located in the nucleus. Each human nucleus has this many chromosomes ...
- A. 18
 - B. 24
 - C. 46
 - D. 72
9. The chromosome numbers vary from organism to organism. Dogs have 78 chromosomes and cats have 38. The different pairings of chromosomes outlines the blueprints, which are the source of ...
- A. heredity
 - B. diversity
 - C. pigmentation
 - D. sexuality
10. A single **gene** is an uninterrupted segment of DNA, which contains coded instructions for the cell. Genes are located in the ...
- A. helical strands
 - B. cytoplasm
 - C. globules
 - D. chromosomes
11. Offspring inherit genes from both parents. Most genes in most species exist in an array of possible forms known as ...
- A. alleles
 - B. genomes
 - C. traits
 - D. chromosomes
12. To understand how genes, chromosomes and alleles are linked to inherited characteristics inferences are made. For each characteristic there must be ...
- A. a single gene pair involved
 - B. more than one gene pair involved
 - C. 2 alleles are present for each gene
 - D. several alleles for each chromosome

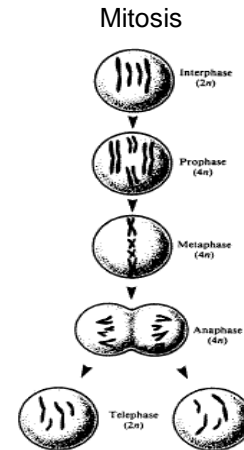
Cell Division

13. A single fetus that grew into a full size human from one sperm cell was a hypothesis held by scientists until the ...
- A. telescope was invented
 - B. microscope was improved
 - C. first MRI was built
 - D. DNA model was developed
14. The process that produces two new cells with the same number of chromosomes is called ...
- A. meiosis
 - B. mitosis
 - C. pollination
 - D. fertilization
15. The **Science of Genetics** is the study of how these types of characteristics are passed on from generation to generation ...
- A. symmetrical
 - B. meiotic
 - C. observable
 - D. heritable

16. Use the illustration to help you answer this question

Mitosis produces two offspring cells with the same number of chromosomes as the parent cell. Mitosis is associated with ...

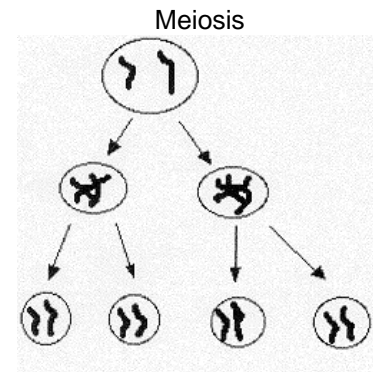
- A. pollination
- B. photosynthesis
- C. sexual reproduction
- D. asexual reproduction



17. Use the illustration to help you answer this question

Meiosis produces four sex cells that have half the number of chromosomes of the parent cell. Meiosis is associated with ...

- A. only one cell dividing into two
- B. two cell divisions, instead of one
- C. unique chromosomes
- D. duplication – making an exact copy



Patterns of Inheritance

18. A breeder who wishes to produce a certain breed of animal that displays the characteristics that are desired should choose only ...
- A. hybrid offspring
 - B. hybrid parents
 - C. purebred parents
 - D. purebred offspring
19. A trait that will always be visible in the offspring of purebred parents despite the apparent difference in the parents is called a ...
- A. hybrid trait
 - B. recessive trait
 - C. observable trait
 - D. dominant trait
20. Other patterns of inheritance include examples like when a purebred plant bearing one color of flower is crossed with another purebred with a different color flower, all the offspring have an intermediate color which is known as ...
- A. offspring unlike either parent
 - B. incomplete dominance
 - C. environmental factors
 - D. hybrid recessive traits

Predict what offspring would occur following the mating of the following parents. Identify the offspring by completing the **Punnit Square** for each combination.

purebred white cow (recessive **ww**) + purebred brown bull (dominant **BB**)

purebred brown cow (dominant **BB**) + purebred brown bull (dominant **BB**)

purebred white cow (recessive **ww**) + purebred white bull (recessive **ww**)

hybrid brown cow (dominant **Bw**) + purebred white bull (recessive **ww**)

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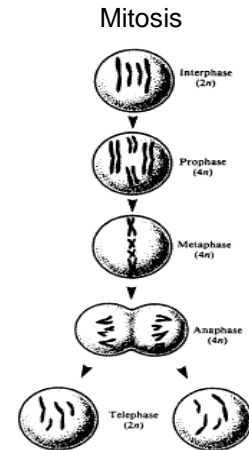
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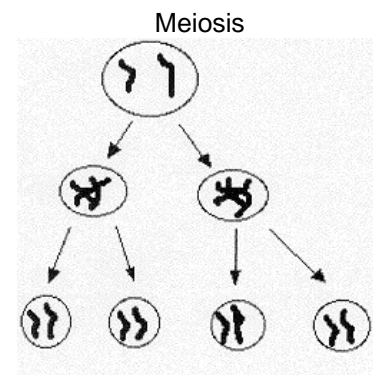
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	w	w
B	Bw	Bw
B	Bw	Bw

purebred brown cow (dominant **BB**) + purebred brown bull (dominant **BB**)

	B	B
B	BB	BB
B	BB	BB

purebred white cow (recessive **ww**) + purebred white bull (recessive **ww**)

	w	w
w	ww	ww
w	ww	ww

hybrid brown cow (dominant **Bw**) + purebred white bull (recessive **ww**)

	B	w
w	Bw	ww
w	Bw	ww