

Name: _____ Class: _____ Date: _____

ID: A

genetic engineering

Chp 13

Modified True/False

Indicate whether the sentence or statement is true or false.

- _____ 1. Without selective breeding, dogs today would probably be less similar. _____
- _____ 2. Hybrids are often hardier than either of their parents. _____
- _____ 3. Exposing a population of plants to radiation or certain chemicals can increase the frequency of mutations that occur within the population. _____
- _____ 4. A polyploid plant has more than two copies of each gene. _____
- _____ 5. During DNA sequencing, if all the bands on an electrophoresis gel are the same color, the single-stranded DNA sample consisted of one kind of fragment. _____
- _____ 6. To transform a plant, scientists inject DNA into an adult plant. _____
- _____ 7. To produce a recombinant plasmid, the plasmid and the foreign DNA are cut with a different restriction enzyme. _____
- _____ 8. Scientists use genetic markers to determine which animal cells have been successfully transformed. _____
- _____ 9. Bacterial cells that have been transformed with a plasmid that carries a genetic marker for resistance to the antibiotic tetracycline will not survive in a culture treated with tetracycline. _____
- _____ 10. Some transgenic animals grow faster because they have extra copies of growth hormone genes. _____

Multiple Choice

Identify the letter of the choice that best completes the statement or answers the question.

- _____ 11. Which of the following is NOT an example of selective breeding?
 - a. allowing only the best milk-producing cows to reproduce
 - b. crossing disease-resistant plants with plants that produce high food yields
 - c. mating cats that have long hair with cats that have long tails
 - d. allowing dogs to mate only once a year
- _____ 12. Which of the following is most likely to bring together two recessive alleles for a genetic defect?
 - a. inbreeding
 - b. hybridization
 - c. genetic engineering
 - d. transformation
- _____ 13. To make a new line of plants, Burbank used the process of
 - a. inbreeding.
 - b. hybridization.
 - c. transformation.
 - d. genetic engineering.

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- _____ 14. The crossing of buffalo and cattle to produce beefalo is an example of
- inbreeding.
 - hybridization.
 - genetic engineering.
 - transformation.
15. Scientists produced oil-eating bacteria by
- making bacteria polyploid.
 - inbreeding bacteria.
 - inducing mutations in bacteria.
 - hybridizing bacteria.
- _____ 16. What is the ultimate source of genetic variability?
- inbreeding
 - radiation
 - hybridization
 - mutations
17. Polyploidy instantly results in a new plant species because it
- changes a species' number of chromosomes.**
 - produces a hardier species.
 - causes mutations.
 - all of the above
18. Mutations are useful in selective breeding because they
- help maintain the desired characteristics of animal breeds.**
 - are usually found in hybrids.
 - are usually beneficial.
 - can be used to **enhance** the process of hybridization.

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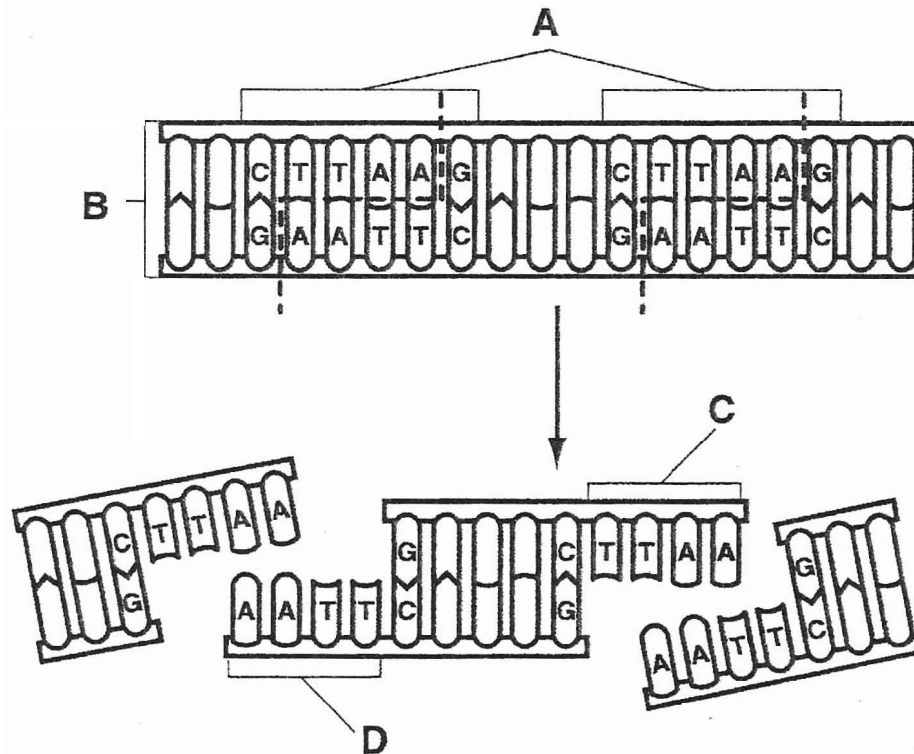


Figure 13-1

- _____ 19. In Figure 13-1, between which nucleotides is the DNA cut?
- adenine and thymine
 - cytosine and guanine
 - thymine and cytosine
 - adenine and guanine
- _____ 20. The process of making changes in the DNA code of a living organism is called
- selective breeding.
 - genetic engineering.
 - inbreeding.
 - hybridization.
21. A DNA molecule produced by combining DNA from different sources is known as
- a mutant.
 - a hybrid.
 - a polyploid.
 - recombinant DNA.
22. Analyzing DNA by gel electrophoresis allows researchers to
- identify similarities and differences in the genomes of different kinds of organisms.
 - determine whether a particular allele of a gene is dominant or recessive.
 - compare the phenotypes of different organisms.
 - cut DNA with restriction enzymes.

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- _____ 23. Which of the following are NOT used to read DNA sequences?
- nucleotides
 - gels
 - fluorescent dyes
 - double-stranded DNA molecules
- _____ 24. If two DNA samples showed an identical pattern and thickness of bands produced by gel electrophoresis, the samples contained
- the same amount of DNA.
 - fragments of the same size.
 - the same DNA molecules.
 - all of the above
- _____ 25. During transformation,
- a prokaryote is changed into a eukaryote.
 - a cell takes in DNA from outside the cell.
 - foreign DNA is inserted into a plasmid.
 - a cell is mutated.
- _____ 26. A recombinant plasmid gets inside a bacterial cell by
- inducing mutations.
 - injecting itself into the cell.
 - transformation.
 - recombining with the cell.
- _____ 27. Which of the following includes all the others?
- plasmid
 - transformed bacterium
 - foreign gene
 - recombinant DNA
- _____ 28. Which of the following steps is NOT essential in producing recombinant DNA?
- Cut out a piece of DNA from a DNA molecule.
 - Splice a piece of DNA into DNA from another organism.
 - Use a restriction enzyme to form sticky ends in DNA.
 - Read the DNA sequence of the piece of DNA to be cut and spliced.
- _____ 29. Which of the following is often used as a genetic marker?
- a foreign gene
 - a gene for antibiotic resistance**
 - a DNA sequence that serves as a bacterial origin of replication
 - a nucleotide labeled with a fluorescent dye
- _____ 30. What kind of technique do scientists use to make transgenic organisms?
- hybridization
 - inbreeding
 - inducing of mutations
 - genetic engineering
- _____ 31. The Scottish scientist Ian Wilmut cloned a
- bacterium.
 - sheep.
 - plant.
 - cow.

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- _____ 32. Which of the following is a clone?
- a. the adult female sheep whose DNA was used to produce Dolly
 - b. a transgenic mouse
 - c. **a bacterium taken from a bacterial colony**
 - d. the tobacco plant with the luciferase gene
- _____ 33. What kind of cell (or cells) was used to make Dolly?
- a. body cell only
 - b. egg cell only
 - c. **egg cell and sperm cell**
 - d. body cell and egg cell