

Directed Reading B *continued*

DNA REPLICATION

22. The pairing of bases allows the cell to replicate, or make copies of DNA.

23. In a DNA molecule, pairs of bases are complimentary to each other, since each base always bonds with only one other base.

24. In a DNA molecule, what base sequence is complementary to the sequence CGAC?

GCTG

25. In what direction does a DNA molecule split during replication?

It splits down the middle

26. As a DNA molecule splits, what is added to the exposed bases on the original molecule?

nucleotides

27. What happens to DNA every time a cell divides?

It is copied into another set of sister chromatid chromosomes

28. In the cell, what does the job of unwinding, copying, and rewinding the DNA?

special proteins called centrioles

Skills Worksheet

Directed Reading B

Section: How DNA Works (pp. 212–217)

1. How much DNA does a single cell in your body hold?

You have billions of nucleotides stored in 46 chromosomes

UNRAVELING DNA

2. What makes up a chromosome?

DNA molecules wrapped around proteins

3. What is chromatin?

DNA and proteins inside the nucleus

4. What happens to DNA to make it fit inside a cell?

It condenses (gets smaller - more concentrated) by coiling up.

5. What forms the code that carries information for DNA?

Sequences (pattern) of nucleotide bases represents our codes of DNA.

6. A string of nucleotides that give the cell information about a certain trait is known as a(n) **gene**.

7. Describe the genetic material contained in each of the 46 chromosomes of a human cell just before division.

The DNA strands are the most tightly coiled and condensed into V shaped chromatids. This way they are small unit packages that can be separated during mitosis.

8. Describe the chromatids that make up a chromosome when a cell is ready to divide.

When a cell is ready to divide, the sister chromatids (2 V's) are held together at the center by a centromere protein
This makes them look like X's

GENES AND PROTEINS

groups of 3 bases called triplets

9. How are the codes for specific amino acids formed?

- a. with groups of three bases
- b. with groups of four bases
- c. with a pair of bases
- d. with groups of proteins

Directed Reading B *continued*

- protein** 10. A long string of amino acids forms a
- a. nucleotide.
 - b. cell.
 - c. trait.
 - d. protein.

- one gene = one protein** 11. A set of instructions for making a particular protein is a(n)
- a. nucleotide.
 - b. amino acid.
 - c. gene.
 - d. chromosome.

- proteins** 12. The chemical triggers and messengers for many processes within cells are
- a. mutagens.
 - b. chromatids.
 - c. ribosomes.
 - d. proteins.

- thousands** 13. How many genes that code for proteins does a single organism typically have?
- a. hundreds
 - b. thousands
 - c. hundreds of thousands
 - d. millions

- RNA** 14. A molecule present in all living cells that plays a role in protein production is
- a. RBA.
 - b. RUA.
 - c. RCA.
 - d. RNA.

- uracil** 15. The base that replaces thymine in RNA is called
- a. adenine.
 - b. guanine.
 - c. uracil.
 - d. cytosine.

16. What two forms of RNA work with ribosomes to make proteins?

tRNA = transfer RNA
and mRNA = messenger RNA

Directed Reading B *continued*

Match the correct description with the correct term. Write the letter in the space provided.

- | | | |
|---------------|--|------------------|
| messenger RNA | 17. a mirrorlike copy of one side of the segment of DNA containing a gene | a. ribosome |
| ribosome | 18. the “factory” in the cytoplasm where a new protein molecule is made | b. messenger RNA |
| transfer RNA | 19. molecules that pick up specific amino acids from the cytoplasm, whose bases match up with bases on messenger RNA | c. protein |
| protein | 20. molecule formed when amino acids released by transfer RNA link then fold up | d. transfer RNA |

CHANGES IN GENES

- mutation 21. A change in the nucleotide-base sequence of a gene or DNA molecule is called a(n)
 a. mutagen.
 b. mutation.
 c. antigen.
 d. chromatid.
- mutation 22. Random errors when DNA is copied are called
 a. mutagens.
 b. mutations.
 c. antigens.
 d. chromatids.
- mutagen 23. A physical or chemical agent that can cause a mutation in DNA is called a(n)
 a. mutagen.
 b. protein.
 c. antigen.
 d. chromatid.

24. What is one example of a mutation that causes an improved trait?

A mutation that makes an organism better able to survive during a drought (lack of water period of time). Ex. leaves that have the mutation to make thicker waxy cuticle layers will dehydrate slower.

25. Why do some mutations cause no changes to a trait?

Sometimes a triplet of DNA code can have a changed letter, but the genetic code will still decipher and translate (change into amino acid sequences) with the correct amino acid.