Name:_____ Date:_____ Per:_____

DNA: The Molecule of Life

Answers may be found in these places:
Genes and DNA – pages 25-35
Your Life Science Textbook – pages 110-115
Internet Sites:
www.yourgenome.org/ click on beginner unless otherwise noted
www.pbs.org/wqbh/nova/genome click on Journey into DNA
https://www.nobelprize.org/educational/medicine/dna_double_helix/readmore.html

DNA Discoveries:

1. What discoveries did these scientists make about DNA?
   a. 1869 – Fredrich Miescher –

   b. 1944 – Oswald Avery –

   c. 1950 – Rosalind Franklin –

   d. 1952 – James Watson and Francis Crick –

DNA Structure:
Use the picture on page 29 (Genes & DNA) to complete this drawing of a DNA molecule.

2. What do the letters DNA stand for? _____.

3. DNA is found on _____ in the _____ of the cell. DNA contains the _____or coded instructions that are needed to build and run cells.

4. What shape is the DNA molecule? _____

This looks like a _____.

5. DNA is made up of building blocks called _____. The sides of the DNA "ladder" are made up of _____ and a _____. The rungs are made up of bases called:

_____ = adenine _____ = cytosine

_____ = guanine _____ = thymine

6. "A" always pairs with _____. "C" always pairs with _____.

<u>Making Copies and Matching Up:</u>

7. DNA can make a _____ of itself. The two strands _____ like a zipper opening. Then, each side acts as a _____ or pattern. New bases and sides attach and _____ new identical DNA strands are produced.

<u>Coded Message:</u>

8. The four letter in the DNA strand spell out three letter "words" called _____. These sequence of codons make up a _____, just like words make a sentence or paragraph.

How many combinations can be used to make a codon? _____

Some codons can tell the cell to _____ working or to _____working.

<u>DNA at Work: Proteins:</u>

9. The DNA in genes controls the production of _____.

a. _____ speed up chemical reactions.

b. proteins build _____, _____, and _____.

c. proteins are made of building blocks called _____ _____.

d. there are _____ types of amino acids.

What jobs do proteins do for the cells?

What is junk DNA?

Copying the Message:

10. Proteins are made in the _____. _____ (ribonucleic acid) copies a gene from the DNA. RNA is a lot like DNA with these exceptions: RNA has _____ strand and does not have the letter _____, it has _____ instead. The type of RNA that goes out in the cytoplasm with the pattern to make a protein is called _____ RNA.

What does ribosomal RNA do?

Translating the Code:

11. The mRNA attaches itself to the _____. The coded instructions are made of three letter _____. In the ribosome, another RNA called _____ RNA picks up amino acids and matches them to specific codons on the mRNA. The cell uses the genetic code to translate the language of _____, written codons, to the language of _____, written in amino acids. This makes new _____.

Mutations - Changing the Message:

12. What is a mutation?

13. Mutations may be _____, _____ or have _____.

14. Mutations can change the "message" of the cell by _____ the "letter" for another, by leaving _____ a base or "letter", or by _____ a base.

15. Two mutations that cause diseases are:

a. _____ _____ _____ causes a change in the shape of red blood cells.

b. _____ causes blood to not clot properly.

Human Genome Project:

16. Humans have _____ chromosomes in their body cells.

The number of chromosomes in a cell depends on the _____ of the animal it is from.

17. The human genome is all the _____ in one complete _____ of _____.

18. The goal of the human genome project is to find out the order of the _____ that make up the coded messages of genes and to make a complete _____ of the genome, showing where the genes are found.

19. How large is the genome of one human cell?

20. How many pairs of "A"'s and "T"'s and "G"'s and "C"'s are there?

21. What device did the scientists use to help them? _____

22. What 3 amazing facts did this project discover?

23. How might we use this information in the future?