1) Explain the difference between environmental and inherited traits
   Inherited traits are traits that you get from your parents that are influenced by your genes. Environmental
   traits are influenced by your environment (you can learn them or control them).

2) List 3 examples of inherited traits. Explain why these traits are inherited traits.
   Natural hair color, natural eye color, dimples, height, tongue roll, etc. These traits are inherited traits
   because they are traits that are passed down from parents and are coded for by your DNA instructions.

3) List 3 examples of environmental traits. Explain why these traits are environmental traits.
   Favorite music, good basketball player, language you speak, etc. These traits are environmental traits
   because they are traits that you choose or learn or that are influenced by the place you live.

4) Define each word, then write your OWN definition of the word.
   a. Heredity – The passing of traits from parents to offspring
   b. DNA – The instructions or code that lives in the nucleus of a cell
   c. Genes – A section of a chromosome that codes for a particular trait
   d. Alleles – The options or choices for the genes. Different forms (options) of a single gene.
   e. Chromosomes – A tightly coiled, organized structure of DNA

5) Fill out the following diagram with the words: Chromosomes, DNA, Alleles, Genes, Alleles (alleles is used
   twice). The largest structure should label the largest circle
6) How do they relate? Explain how each of the two terms below relate to each other in a sentence.
   a. DNA and Chromosomes (example: DNA and chromosomes relate to each other because chromosomes are made of DNA).
   b. DNA and Genes DNA makes up genes.
   c. Genes and Alleles The options or choices for the genes are called alleles.
   d. Genes and Chromosomes Genes are segments or pieces of a chromosome.

7) In 2-5 sentences, put the pieces together and explain the complete relationship between DNA, Genes, Alleles, and Chromosomes.
   Chromosomes are made of segments of genes, which have options known as alleles. Genes are made of DNA which contains the code for our inherited traits.

8) Develop an analogy to explain the relationship between DNA, Genes, Alleles, and Chromosomes.
   If the Nucleus is a library, the Chromosomes would be the shelves. The Genes would be the books and the Alleles would be the genre of book. The DNA would be the words.

9) Fill in the chart below with any examples (just like p7 in Notes)

<table>
<thead>
<tr>
<th>Gene</th>
<th>My allele</th>
<th>Someone else’s allele</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye Color</td>
<td>Ms. Bland - brown</td>
<td>Ms. Green - blue</td>
</tr>
<tr>
<td>Hair Color</td>
<td>Ms. Bland - brown</td>
<td>Ms. Francis - blond</td>
</tr>
</tbody>
</table>

10) What did Gregor Mendel discover? Why is this discovery important in our lives today?
    Dominant and recessive traits and the role of genes. Genetic counselors can trace how a disease is passed down in a family, and help people decide whether or not to have children.

11) What did Rosalind Franklin discover? Why is this discovery important in our lives today?
    She took the first x-ray photo of DNA, which showed that DNA is a spiral. Understanding the structure of DNA has led to modern medical breakthroughs like genetic engineering and cloning.

12) What did Francis Crick and James Watson discover? Why is this discovery important in our lives today?
    He was on the team that discovered the structure of DNA, including the double helix shape and the base pairs. Understanding the structure of DNA has led to modern medical breakthroughs like genetic engineering and cloning.
13) What does DNA stand for?  Deoxyribonucleic Acid

14) What are the three main components of DNA?

Phosphates  Sugars  and  Nitrogen Bases

15) What are the four bases that are used in DNA?

Adenine  Thymine  Cytosine  Guanine

16) How do the bases pair up in DNA?

A–T  C–G

17) Draw the shape of DNA:

18) Explain the memory maker: PBS makes Kids.

Phosphates, Bases and Sugars make DNA, which makes a new person

19) What would the complementary strand of DNA be for the following sequence of bases:

\text{A T A C G T T T G C A A}
\text{T A T G C A A A A C G T T}

20) DNA has the ability to make an exact copy of itself. Draw and explain how DNA Replicates. Why is this ability important for life to continue? The DNA molecule splits apart and each \( \frac{1}{2} \) strand of DNA is used as a template to make a new molecule. Each new DNA molecule is an exact copy of the original molecule, but contains one old strand and one new strand. In order for a parent cell to make a daughter cell, there must be a set of instructions. The ability to pass on those instructions is necessary to ensure that the cells function correctly. Making an exact copy of the instructions during replication is part of what makes DNA an information molecule.