Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Introduction

* Except for identical twins, ***(1)*** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ have the same DNA.
* Since ***(2)*** \_\_\_\_\_\_\_\_\_\_\_\_ DNA has been used to investigate crimes, establish paternity, ID victims of war and large scale disasters.
* DNA is ***(3)*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** evidence
* Analysis of chromosomes of a sample of cells is ***(4)*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

History of Biological Evidence in Forensics

* James ***(5)*** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and Francis ***(6)*** \_\_\_\_\_\_\_\_\_\_\_\_\_\_--1953 discovered the configuration of the DNA molecule
* Ray White--1980 describes first polymorphic RFLP marker
* ***(7)*** \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_--1985 isolated DNA markers and called them DNA fingerprints

Link to Google form:

http://goo.gl/forms/WiffdwbhMr

* Kary Mullis--1985 developed ***(8)*** \_\_\_\_\_\_\_\_\_\_\_\_\_ testing
* 1988—***(9)*** \_\_\_\_\_\_\_\_ starts DNA casework
* 1991--first STR paper
* 1998--FBI launches ***(10)***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ database.

***DNA (11) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***

* + Also known as DNA ***(12)***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	+ Used with a ***(13)***\_\_\_\_\_\_\_\_\_\_\_\_\_ degree of ***(14)***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* DNA can be extracted from small amounts of ***(15)***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ evidence
* Biological evidence is examined for the presence of inherited traits
* Examples of Biological evidence
	+ ***(16)***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The Function and Structure of DNA

* DNA contains the(17) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ material of a cell; holds all of the (18) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ needed for a cell to make proteins and to replicate.
* (19)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are located in the cell nucleus
* Chromosomes contain long DNA strands (20)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ around proteins

What is a chromosome?

* In the nucleus of each cell, the DNA molecule is (21) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ into thread-like structures called chromosomes.
* Each chromosome is made up of (22) \_\_\_\_\_\_\_\_ tightly (23) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ many times around proteins called histones that support its structure.
* Chromosomes are not visible in the cell’s nucleus—not even under a microscope—when the cell is not (24)\_\_\_\_\_\_\_\_\_\_\_\_.

What is a chromosome?

* Each chromosome has a constriction point called the (25) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, which divides the chromosome into two sections, or “(26)\_\_\_\_\_\_\_\_\_.”
* The (27)\_\_\_\_\_\_\_\_\_\_ arm of the chromosome is labeled the “(28)\_\_\_\_\_\_\_\_\_\_\_\_\_.”
* The (29) \_\_\_\_\_\_\_\_\_\_ arm of the chromosome is labeled the “(30) \_\_\_\_\_\_\_\_\_\_\_\_\_.”

The Function and Structure of DNA

* ***Double helix-***-two coiled DNA strands

The Function and Structure of DNA

* Composed of (31) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_--unit containing a sugar molecule (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_), (32)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ group and a (33) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_-containing base
* The Function and Structure of DNA
* *Nitrogenous Bases*—pairs of molecules that form the rungs of the DNA “ladder”
* Four types of Bases (draw lines showing how the bases pair together)
	+ A (34)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	+ C (36)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	+ G (35)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	+ T (37)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The Function and Structure of DNA

* Human DNA consists of about (38) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bases, and more than (39) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of those bases are the same in all people.
* The order, or (40) \_\_\_\_\_\_\_\_\_\_\_\_\_\_, of these bases determines the information available for building and maintaining an organism, similar to the way in which letters of the alphabet appear in a certain order to form words and sentences.

What is a gene?

* A gene is the basic (41) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and functional unit of (42) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Genes, which are made up of DNA, act as (43) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to make molecules called (44)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* In humans, genes vary in size from a few hundred DNA bases to more than 2 million bases.

What is a gene?

* Every person has (45) \_\_\_\_\_\_\_\_ copies of each gene, one (46) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from each (47)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Most genes are the same in all people, but a small number of genes (less than 1 percent of the total) are slightly different between people.

What is a gene?

* (48) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are forms of the same (49) \_\_\_\_\_\_\_\_\_\_\_\_ with small differences in their sequence of DNA bases.
* These small differences contribute to each person’s (50)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ physical (51)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Genes

Each gene has a (52) **\_\_\_\_\_\_\_\_\_\_\_\_\_\_**,

 a (53) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ on a pair of homologous chromosomes

Genes influence the development of traits

* All of an organism’s (54) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is called the (55)**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

(56)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: refers to the actual genes

1. The gene combination of an organism

* It consists of (57)\_\_\_\_\_\_\_\_\_\_\_\_\_ alleles (one from each parent)
* For example:
	+ Pure dominant, 2 dominant genes
	+ Pure recessive, 2 recessive genes
	+ Hybrid, 1 dominant and 1 recessive gene
* (58) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: (59) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ expression of a trait

The way an organism (60)\_\_\_\_\_\_\_\_\_\_\_\_\_\_