CORNELL NOTES
Directions: You must create a minimum of 5 questions in this column per page (average). Use these to study your notes and prepare for tests and quizzes. Notes will be stamped after each assigned sections (if completed) and turned in to your teacher at the end of the Unit for scoring.

UNIT 2: GENETICS
Chapter 7: Extending Medelian Genetics

I. Chromosomes and Phenotype (7.1)

A. _____ copies of each **autosomal** gene affect **phenotype**

1. Most human **traits** are result of _____ **genes**

2. Many human **genetic** _____ also caused by **autosomal genes**

a. Chance of having disorder can be _____

b. Use same principles as _____ did

B. Disorders Caused by _____ **Alleles**

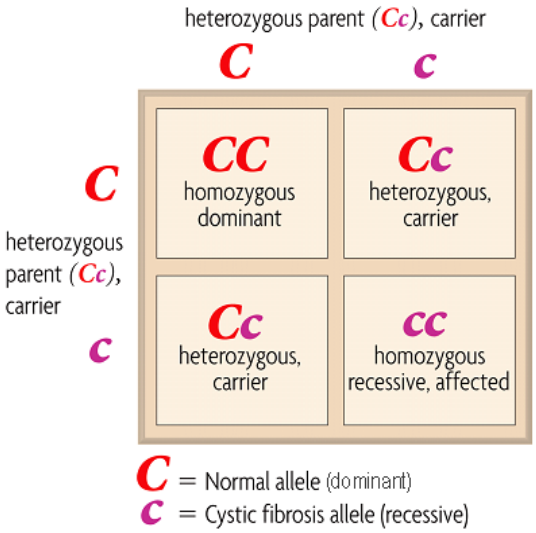
1. Some **disorders** caused by **recessive alleles** on autosomes

2. Must have _____ **copies** of _____ **allele** to have disorder

a. Disorders often appear in offspring of parents who are _____

b. _____ _____- recessive disorder that affects sweat glands and mucus glands.

3. A person who is heterozygous for disease is called a _____- does not show disease symptoms



C. Disorders Caused by **Dominant Alleles**

1. **Less** _____ than recessive disorders

2. **Huntington's Disease**- damages nervous system and usually appears during adulthood.

a. **75% chance** if both parents _____

b. Since disease strikes later in life, person can have children before disease appears. Allele is passed on even though disease is _____

E. Males and Females can differ in _____-linked traits

1. Mendel figured out much about **heredity**, but did <u>not</u> know about _____

a. Mendel only studied _____ traits

b. Expression of genes on **sex chromosomes** _____ from **autosomal genes**

2. Sex-linked Genes

a. Genes located on sex-chromosomes called _____-_____ **genes**

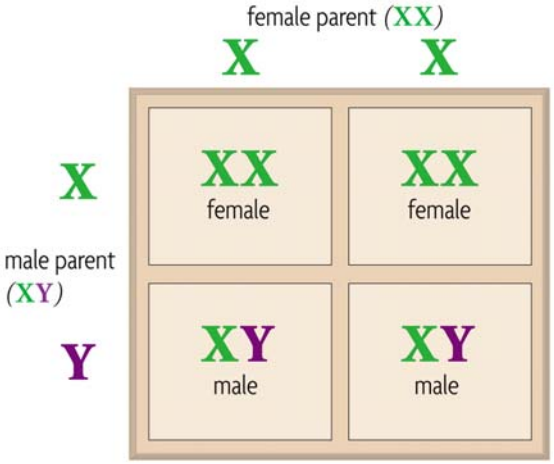
b. Many species have specialized sex _____

1). In mammals and some other animals, individuals with **XX are** _____ and **XY are** _____

2). **X** chromosome much _____than **Y**

3. Expression of Sex-Linked Genes

a. **Males** only have _____ <u>copy</u> of each chromosome (_____)



1). **Express all** _____ on each chromosome

2). No second copy of another allele to mask effects of another allele (**all recessive alleles** _____)

b. In each cell of female, one of two X-chromosome is <u>randomly</u> "_____ **off**"

1). Called **X Chromosome** _____

2). Creates **patchwork** of two types of cells

II. Complex Patterns of Inheritance (7.2)

A. Phenotypes can depend on interactions of _____

1. Many traits are result from alleles with **range of dominance**, rather than a strict _____ and _____ relationship

2. In many cases, phenotypes result from multiple _____

B. **Incomplete Dominance**

1. _____ allele completely dominant

2. **Heterozygous phenotype** somewhere between homozygous phenotypes ("_____")

C. **Codominance**

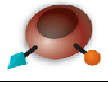
1. **Both traits are expressed** _____

2. Can sometimes look like "blending" of traits, but actually show _____ **of both**

3. **Human** _____ **type** is example of codominance

a. Also has _____ different alleles- trait also considered a _____-_____ **trait**

b. When alleles are neither dominant of recessive (in both incomplete and codominance) use _____ **case letters** with either **subscripts** or **superscripts**)

PHENOTYPE (BLOOD TYPE)		GENOTYPES
A		I^AI^A or I^Ai
B		I^BI^B or I^Bi
AB		I^AI^B
O		ii

D. Many genes may interact to produce one _____

1. _____ **traits**- two or more genes determine trait

a. _____ **color** result of four genes that interact to produce range of colors

b. **Human eye color** shows at least ____genes (hypothesize that are still genes undiscovered as well)

2. **Epistasis**- when one gene _____ all of the others. _____ is caused by this type of gene

3. The _____ interacts with **genotype**

a. _____ is <u>more than sum</u> of **gene expression**

b. Sex of sea turtles depends on genes and **environment**. _____ when eggs develop determine sex

c. **Human** traits also affected by **environment** (_____ and _____ care)

III. Gene Linkage and Mapping (7.3)

A. Gene linkage was explained through _____ _____

1. **Thomas Hunt Morgan** worked with fruit flies (_____ melanogaster)

2. Some traits seemed to be inherited together. Morgan called them _____ **traits. (found on _____ chromosome)**

3. Morgan concluded that because linked genes were not inherited together every time that chromosomes must exchange homologous genes during _____ (**crossing over**)

B. Linkage maps estimate _____ between genes

1. **Closer together**- more _____ **inherited together**

2. **Further apart**- more likely will be _____ during _____.

IV. Human Genetics and Pedigrees (7.4)

A. Human genetics follows the patterns seen in other organisms

1. Meiosis _____ **assorts chromosomes** when gametes are made for sexual reproduction

3. Human heredity involves same relationships between alleles (dominant/recessive, polygenic, sex-linked, etc)

B. Inheritance of some traits very _____

1. **Multiple genes** and **alleles** can _____

2. _____-gene traits can still be observed

a. Many examples of single-gene traits (hairline-_____ _____)

b. Many genetic _____ also caused by single-gene traits (Huntington's disease, hemophilia, Duchenne's muscular dystrophy)

c. Much of what is known about human genetics comes from studying _____ _____

C. Females can carry a sex-linked genetic disorder

1. Both **male and females** can be <u>carriers</u> of _____ **disorders**

2. **Only females** can be <u>carriers</u> of ___**-linked disorders**

3. Many genetic disorders carried on ___**-chromosome**

a. **Male** who has gene for disorder on X-chromosome will have _____

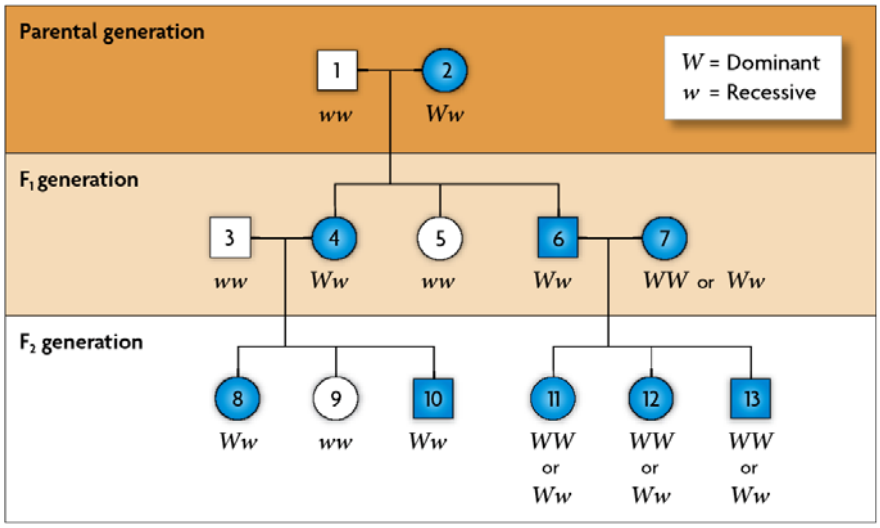
b. **Males** more _____ to have this **disorder**

D. A _____ is a chart for tracing genes in a family

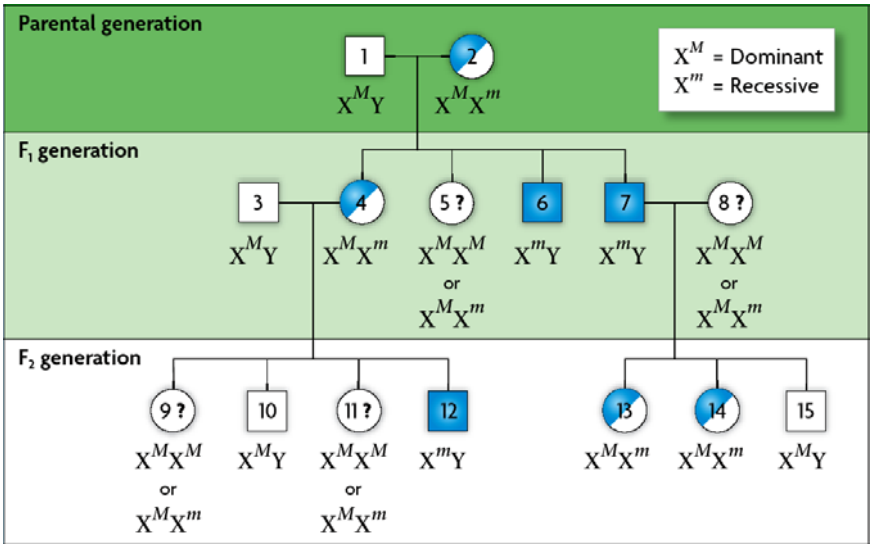
1. **Phenotypes** are used to infer _____ on a pedigree

2. **Autosomal genes** show different _____on a pedigree than **sex-linked genes.**

a. **Autosomal genes**



b. **Sex-linked genes**



E. Several methods help map human chromosomes

1. Human _____ **so large** difficult to map

2. Several methods used

a. **Pedigrees** used for studying genetics in a _____

b. **Karyotypes**- _____ of all chromosomes in a cell

1). _____ used to produce patterns of bands

2). Used to identify certain genetic disorders in which there are **extra** or **too few** _____ (i.e. Down syndrome