*13.1: Human Inheritance*

A. What Are Some Patterns of Human Inheritance?

**\*Some human traits are controlled by single genes with two alleles, and others by single genes with multiple alleles. Still other traits are controlled by many genes that act together.**

1.Single Genes with two alleles – human traits like these are controlled by a single gene.

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ & \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. Single Genes with multiple alleles – multiple alleles (three or more forms of a gene that code for a single trait).

 Review:

Genotype - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Phenotype- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is controlled by a gene with multiple alleles. There are four main types: A, B, AB, and O.

3. Traits controlled by many genes – In humans, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ has more than two distinct phenotypes. In fact, humans have an enormous variety of phenotypes.

 There are at least \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ genes that control height in humans.

 Another human trait controlled by many genes is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

B. What Are the Functions of the Sex Chromosomes?

**\*The sex chromosomes carry genes that determine a person’s gender as being either male or female. They also carry genes that determine other traits.**

1. Girl or Boy? – The only chromosome pair that do not always match are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

2. Sex Chromosomes and Fertilization –

 - Since both of a female’s sex chromosomes are X chromosomes, all eggs carry \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ X chromosome.

- Males have \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ different sex chromosomes, so half of the sperm cells carry an X chromosome and half carry a Y \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

\* If an X sperm cell fertilizes the egg, the egg has two X chromosomes = \_\_\_\_\_\_\_

\* If a Y sperm cell fertilizes the egg, the egg has one X chromosome and one Y chromosome = boy

3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - genes found on the X and Y chromosomes. Often passed from parent to child on a sex chromosome, often called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

\*One sex-linked trait is red-green \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

\* Normal vision is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, colorblindness is recessive.

\* In \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, a dominant allele on an X chromosome will mask a recessive allele on the other X chromosome. **BUT**, in males, there is usually no matching allele on the Y chromosome to mask the allele on the X chromosome. **AS A RESULT**, any allele on the X chromosome – even a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ allele – will produce the trait in a male who inherits it.

 \*\*This means males are more likely to show a sex-linked recessive trait\*\*

 4. Inheritance of Colorblindness – Punnett square practice.

\*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - person who has one recessive allele for a trait and one dominant allele.

\***With sex-linked traits, only females can be carriers b/c they are the only ones who can carry two alleles for the trait.**

**PRACTICE:** See page 449 in your book.