

BIOLOGY 11 – PRE-LAB EXERCISE

18+20

Name: **Answer Key**

5

Lab Day & Time:

Human Genetics & Inheritance

1. What is a gene?

A unit of heredity. A region of DNA with instructions for making a specific protein.

- How did you get two copies of each of your genes? **One from my mother, one from my father.**
- What are alleles? **Different versions of the same gene.**
- Define the term “homozygous.” **The same two alleles for a given gene.**
- Define the term “heterozygous.” **Two different alleles for a given gene.**

2. What is the difference between your genotype and your phenotype? **Genotype: which alleles are present for a specific gene. Phenotype: the observable trait resulting from that genotype.**

What is the difference between a dominant trait and a recessive trait?

Dominant trait phenotype is observed with either homozygous or heterozygous genotype.

Recessive trait phenotype is only observed if genotype is homozygous for that allele.

3. What is a “Punnett Square”?

A table illustrating the probability of possible genotypes of the offspring from two parents based upon their genotypes.

4. The symbol for the “Freckles” allele is “**F**” and the symbol for the “No freckles” allele is “**f**”.

- Which allele is recessive? **f** And which is dominant? **F** How do you know? **Capital letter = dominant**
- What is the genotype of someone without freckles? **ff**
- What is/are the genotype(s) of the gametes from someone without freckles? **f**
- What is the **phenotype** of someone heterozygous for freckles? **has freckles** What is their **genotype**? **Ff**
- What is the **phenotype** of someone homozygous dominant for freckles? **has freckles** What is their **genotype**? **FF**

5. What are homologous chromosomes (= homologues)? **Two versions of the same chromosome.**

(One inherited from my mother, one from my father.)

- Which gender, in humans, has sex chromosomes that are homologous? Name the chromosomes.
Female XX
- Which gender, in humans, has sex chromosomes that are not homologous? Name the chromosomes.
Male XY

6. What is meant by a sex-linked trait? **Determined by a gene located on a sex chromosome (X or Y).**

- Why are males more often affected by X-linked diseases than are females? **Usually recessive, so a female must inherit it from both parents. But males only have one X so only need to inherit it from their mother.**

7. Give an example of a recessive genetic disorder. **cystic fibrosis, phenylketonuria, Tay-Sachs disease, sickle-cell disease**

- Give an example of a dominant genetic disorder. **neurofibromatosis, Huntington disease**

- In a pedigree, what symbol indicates a normal female? **○ = open circle**

- In a pedigree, what symbol indicates a male affected with the genetic disorder? **■ = filled square**