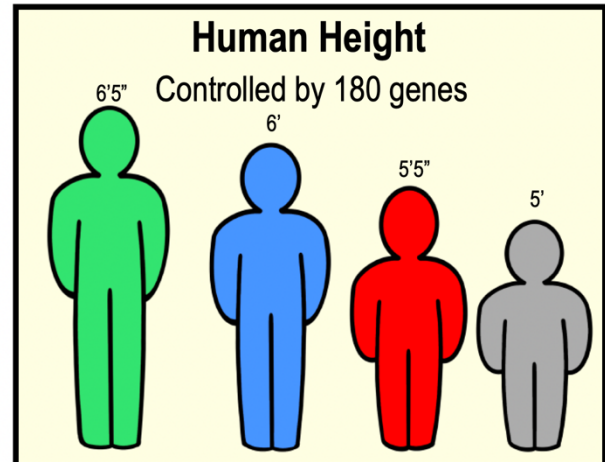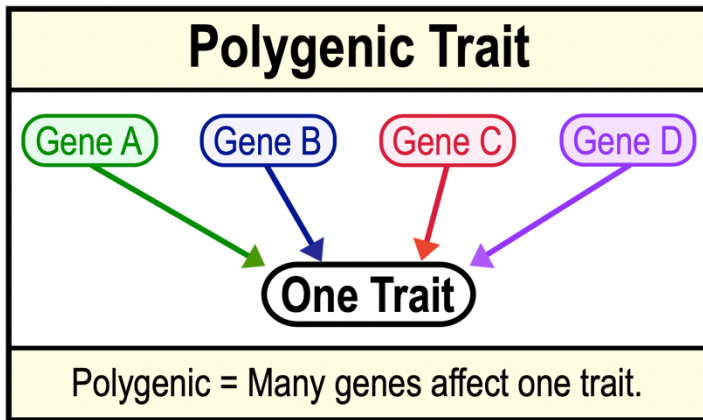**CONCEPT:** NON-MENDELIAN GENETICS

Polygenic Inheritance

●*Most* inherited traits are _____.

　□ ***Poly*genic Trait**: a *single* phenotypic trait affected by _____ *genes.*
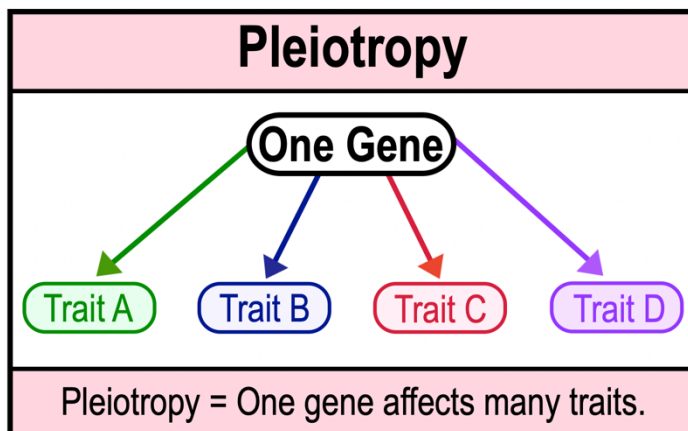
EXAMPLE: Polygenic Inheritance.

PRACTICE: Which of the following phenotypes is an example of polygenic inheritance?

a) White or purple flower color in pea plants.

b) Yellow or green pea color in pea plants.

c) The ABO blood groups in humans.

d) Skin pigmentation in humans.

Pleiotropy

●Pleiotropy is practically the _____ of polygenic.

　□ **Pleiotropy**: a *single* _____ has effects on _____ phenotypic traits.

EXAMPLE: Marfan Syndrome.

<u>**CONCEPT:**</u> NON-MENDELIAN GENETICS

**PRACTICE:** A pleiotropic genetic disorder typically has what characteristics?

    a) A single gene is mutated resulting in the change of one phenotypic trait.

    b) A single gene is mutated resulting in the change of many phenotypic traits.

    c) Many genes are mutated resulting in the change of one phenotypic trait.

    d) Many genes are mutated resulting in the change of many phenotypic traits.

Multifactorial Characters

●**Multifactorial Characters**: inherited features or phenotypes that are influenced by _____ types of factors.

    □ These include *genetic* factors (alleles) & _____ factors (Ex. pH, temperature, etc.).

EXAMPLE: Effects of Environment (pH of soil) on Flower Color Phenotypes.

Hydrangea Flower Color

Soil pH

Neutral
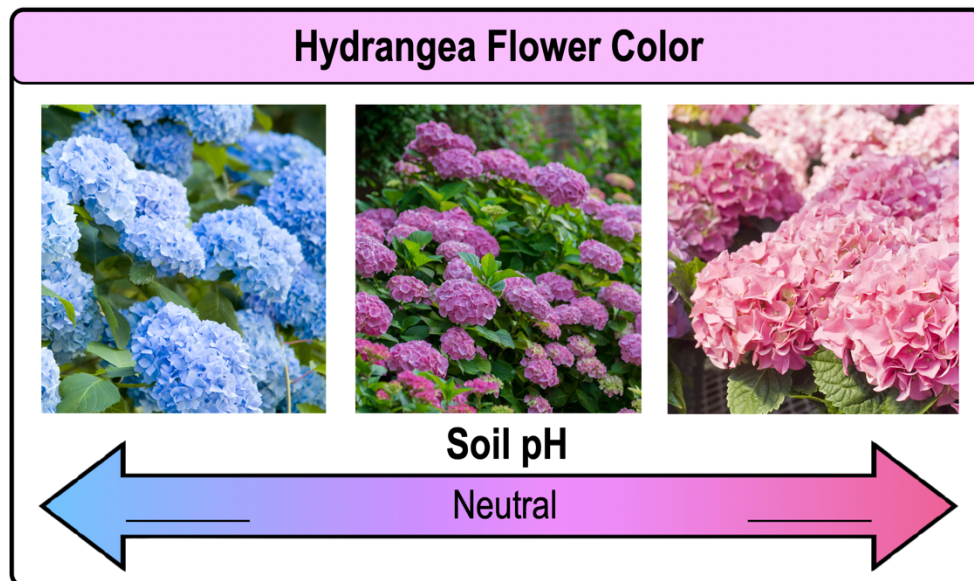
PRACTICE: Hydrangea plants of the same genotype are planted in a large flower garden. Some of the plants produce blue flowers and others pink flowers. This can be best explained by which of the following?

    a) The knowledge that multiple alleles are involved.

    b) The allele for blue hydrangea is completely dominant over the allele for pink hydrangea.

    c) The alleles are codominant.

    d) Environmental factors such as soil pH affect the phenotype of flower color.

PRACTICE: A phenotype is controlled by gene A and gene B. Gene B controls the expression of gene A. This is an example of _____.

    a) Incomplete Dominance.   c) Codominance.   e) Alleles.

    b) Epistasis.   d) Multifactorial characters.