Name _____ Date _____

Standard 4-9 Application of principles of modern genetics

VOCABULARY

Genetic engineering-

*replacing specific genes in an organism to express a desired trait.

*accomplished by taking specific genes from one organism and placing them into another organism.

Gene map-

*shows the relative location of each known gene on a chromosome.

Genome-

*refers to all the genetic material in an organism.

*The Human Genome Project that mapped the DNA sequence of human genes is useful in identifying genes for specific traits.

Cloning-

*an identical copy of a gene or an entire organism is produced.

* may occur naturally or may be engineered.

* benefits such as organ transplants or saving endangered species, may also result in genetic disorders or health problems

Gene therapy-

*scientists insert a normal gene into an absent or abnormal gene.
*Once inserted the normal gene begins to produce the correct protein or enzyme, eliminating the cause of the disorder.
* limited success because the host often rejects the injected genetic material.

Stem cells-

*undifferentiated cells that have the potential to become specialized in structure or function.
*primarily found in embryos, but also found all over the adult human body (for example bone marrow)
*Therapy using stem cells can replace tissue that is deficient due to disease or damage.

Selective breeding-

*the method of artificially selecting and breeding only organisms with a desired trait to produce the next generation.
* Almost all domesticated animals and most crop plants are the result of selective breeding.

Inbreeding-
*crossing individuals who are closely related

Hybridization-
*another form of selective breeding
* choosing and breeding organisms that show strong expression for two different traits in order to produce offspring that express both traits.
*occurs often between two different (but similar) species.
*offspring are often hardier than either of the parents.

RESULTS OF GENETIC ENGINEERING

*plants that make natural insecticides, are higher in protein, or spoil (rot) slower

*animals are bigger, faster growing, or resistant to disease

*bacteria produces hormones like human insulin or growth hormone

*humans, possibly, transplant normal genes into people suffering from genetic diseases like Tay-Sachs disease, cystic fibrosis, and sickle-cell anemia