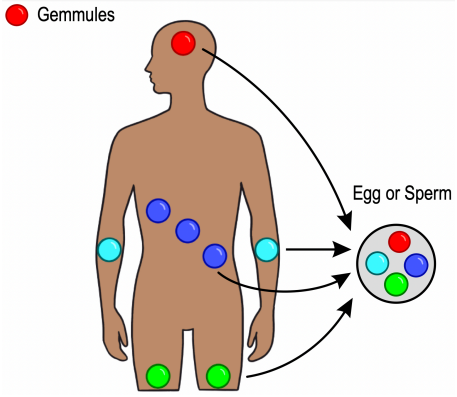
CONCEPT: HISTORY OF GENETICS

- The earliest use of genetics was through domestication of plants and animals (8000-1000 B.C.)
  - □ **Selective breeding (artificial selection)** is the process of breeding organisms for certain phenotypic traits
    - No one knew the principles of what controlled this breeding and had no way to predict what would happen
    - "Like begats like"

EXAMPLE: Carrots having undergone artificial selection

- □ Aristotle and the Hippocratic School of Medicine suggested that *humors* in the male body had traits (300s B.C.)
  - **Pangenesis**: stated that *gemmule* particles were carried from different body parts to reproductive organs
    - These gemmules were passed onto the offspring
    - Allowed for inheritance of acquired characteristics (ex. Musical ability)

EXAMPLE: Diagram of Pangenesis



□ Two theories of inheritance between 1650 and 1850 A.D.

- **Epigenesis**: stated that the organism was derived from substances found in the sex cells

- **Preformation:** stated that the sex cells contained a **homunculus** (miniature adult) that grew

EXAMPLE: A Homunculus

□ Gregor Mendel, an Austrian monk, began studying pea plants in the 1800s.

- **Blending theory of inheritance**: stated that children were a blend of parental traits (like blending paints)

  - This theory was believed at the time of Mendel's studies

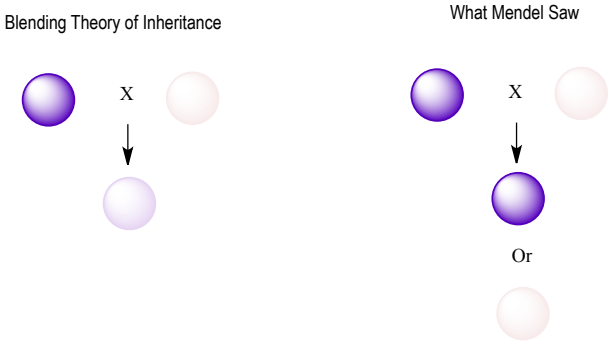
  - Mendel disproved this by mating purple flowers and white flowers – they didn't yield a mixed color

- Mendel proposed that *particles* (not fluids) controlled heredity (the particles are now known as genes)

  - He also proposed that each pea plant has two copies of each particle controlling one trait (color)

  - He also proposed that one would be more dominant than the other – which chooses the trait

EXAMPLE:



□ Mendel, was largely forgotten until the 1900s

- Published his work in 1866 in the Proceeding of the Natural History of Society of Brunn
- William Bateson rediscovered Mendel's work in the 1900s – and termed Genetics
- Thomas H. Morgan demonstrated Mendel's genes were on chromosomes (1910)
  - *Chromosomal Theory of Inheritance*

PRACTICE:

1. Match the following inheritance theory with the appropriate definition.

I.	Pangenesis	_____
II.	Epigenesis	_____
III.	Preformation	_____
IV.	Blending Theory of Inheritance	_____

A. Children were derived from substances found in the sex cells
B. Children are a blend of parental traits
C. Sew cells contain a miniature adult, which will keep growing until adulthood
D. Gemmule particles were carried from different body parts to reproductive organs