

CONCEPT: MENDEL'S LAWS

●Through his research with pea plants, Gregor Mendel proposed 2 fundamental laws of genetics:

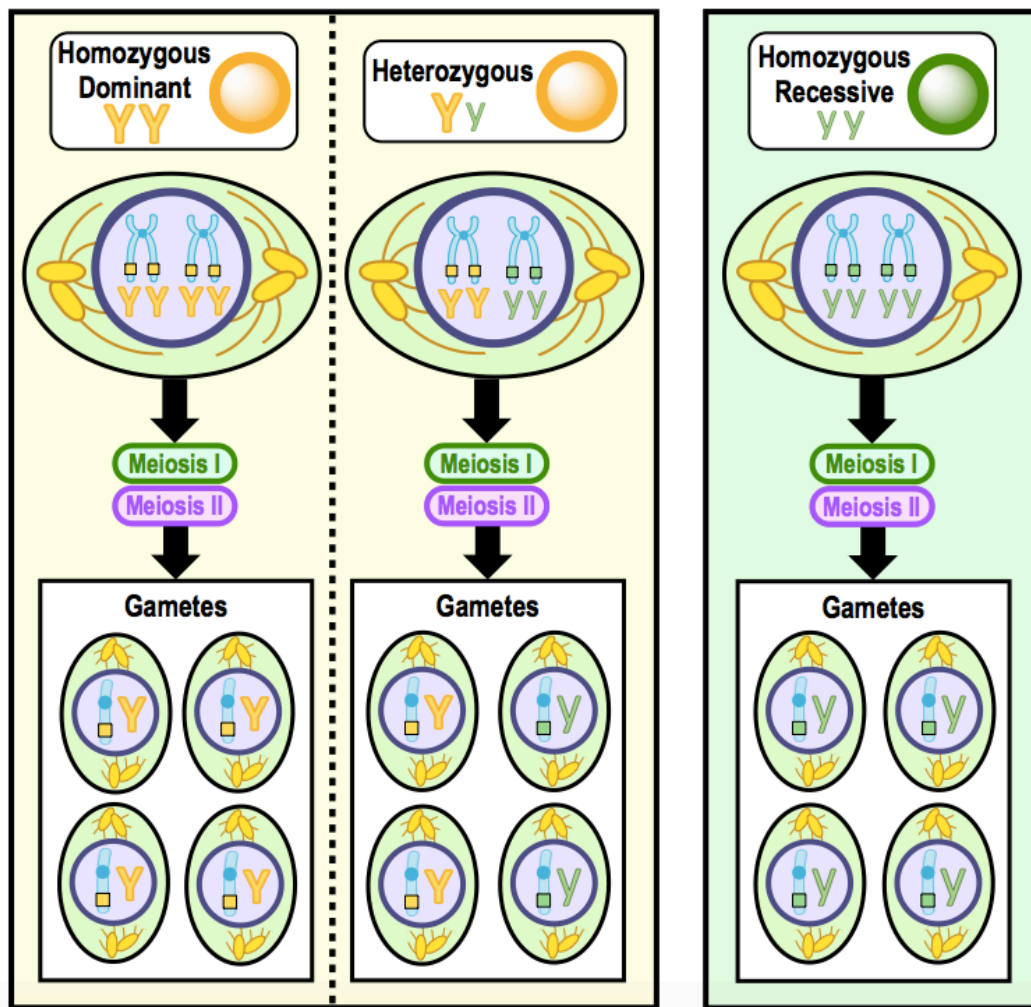
1) Law of _____ & 2) Law of _____ Assortment

1) Law of Segregation

●During gamete formation, 2 alleles of the same gene _____ & end up in _____ gametes.

□ In other words, gametes are _____ & only receive _____ copy of a gene/allele.

EXAMPLE: Law of Segregation.



PRACTICE: According to Mendel's Law of Segregation, which of the following is a true statement?

- a) Each gamete receives both of the parent's alleles for each gene.
- b) Dominant alleles segregate into gametes more frequently than recessive alleles.
- c) Alleles segregate into different gametes with equal frequency.
- d) Recessive alleles segregate into gametes more frequently than dominant alleles.

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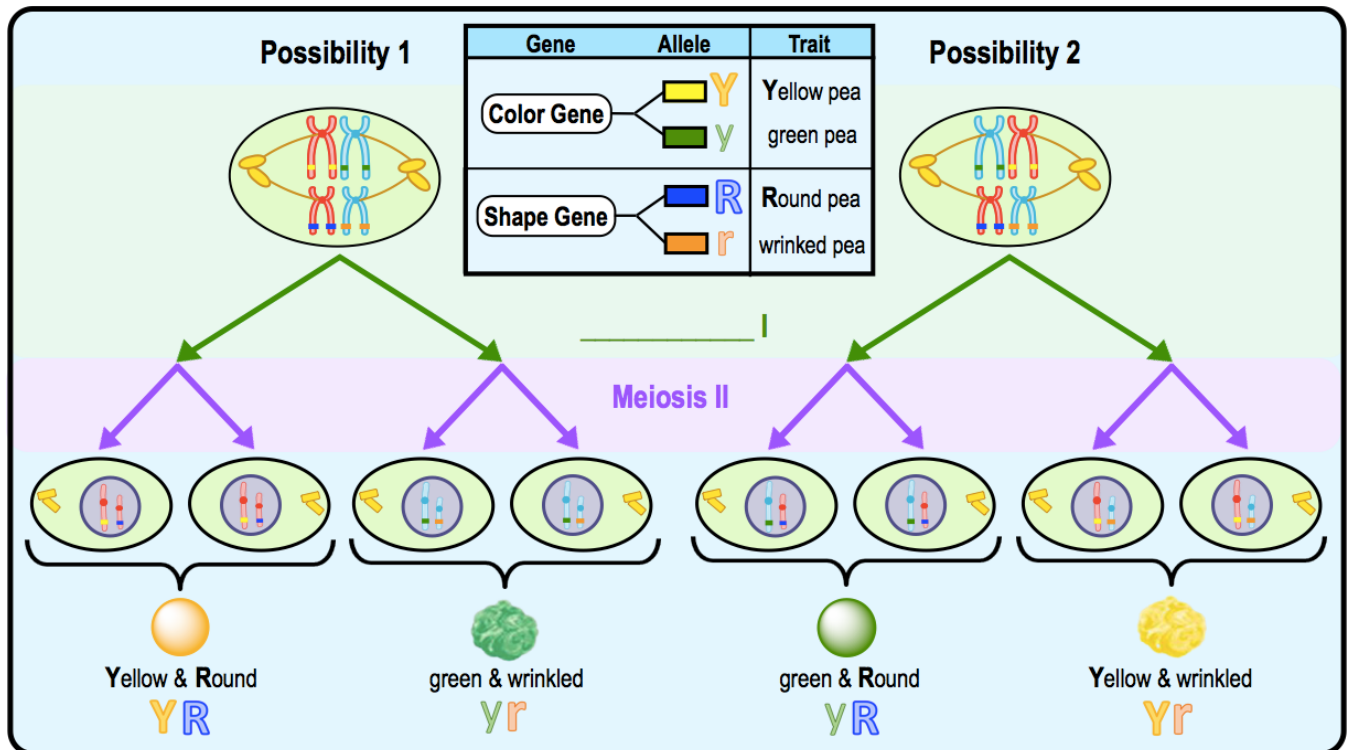
PRACTICE: Mendel's observation of the segregation of alleles in gamete formation has its basis in which of the following phases of cell division?

- a) Prophase I of meiosis.
- b) Metaphase II of meiosis.
- c) Anaphase II of meiosis.
- d) Anaphase I of meiosis.

2) Law of Independent Assortment

- *Recall: Independent assortment*, homologous chromosomes *randomly* align on the metaphase I plate during meiosis I.
- **Law of Independent Assortment:** allele segregation of one gene does _____ affect the segregation of another gene.
 - Allows for gametes with _____ combinations of alleles from different genes.
 - Mendel monitored the inheritance of *multiple* genes to make this discovery using _____ crosses.

EXAMPLE: Independent Assortment During Metaphase I of Meiosis I.



PRACTICE: Mendel's law of independent assortment has its basis in which of the following events of meiosis I?

- a) Synapsis of homologous chromosomes.
- b) Crossing over of homologous pairs of chromosomes.
- c) Alignment of pairs of homologous chromosomes along the middle of the cell.
- d) The division of cells during cytokinesis.