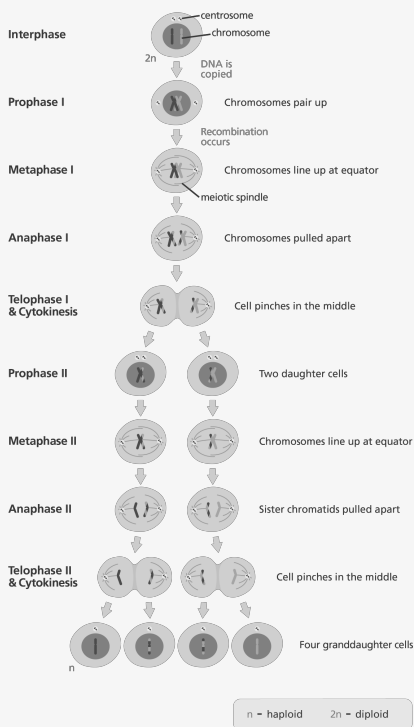


### Meiosis



### Genetic Diversity

#### Meiosis I:

- Separation of the homologous chromosomes allows each gamete to receive haploid (1n) set of chromosomes (both maternal and paternal chromosomes)
- Homologous chromatids exchange genetic material via "crossing over" (recombination)
  - Increases genetic diversity among the resultant gametes

#### Increase Variation:

- Sexual reproduction
  - Crossing over, random assortment of chromosomes during meiosis, and subsequent fertilization of gametes

### Non-Mendelian Genetics

Phenotypic ratios differ from predicted ratios

**Linked genes:** Genes on the same chromosome

**Recombination frequency:**  $(\# \text{ of recombinants} / \text{total} \# \text{ in population}) \times 100 = (\%)$  LMU

**Multiple alleles:** More than 2 alleles present in a population ( $I^A, I^B, i$ )

**Incomplete dominance:** Traits "blended"; neither dominant

**Co-dominance:** Both traits displayed (spots, stripes etc.)

**Sex-Linked:** X or Y linked traits

**Barr Body:** Inactivated X chromosome in each female mammal's somatic cell

**Non-nuclear:** Chloroplasts and mitochondria are randomly assorted to gametes and daughter cells (both maternally inherited in plants and animals)

### Laws of Mendelian Genetics

**Law of Dominance:** when inherited heterozygous, the allele expressed is dominant and the allele not expressed is recessive

**Law of Segregation:** (1) The two alleles for each trait segregate, during the formation of gametes (2) During formation of new zygotes, the alleles will combine at random with other alleles

**Law of Independent Assortment:** different genes and their alleles are inherited independently

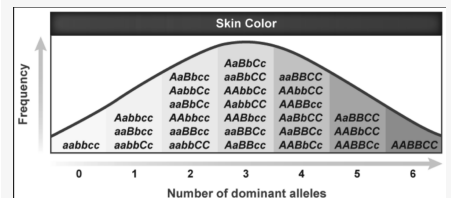
### Types of Crosses

**Monohybrid:** LI x LI; phenotype ratio=3:1; genotype ratio=1:2:1

**Dihybrid:** LI Pp x LI Pp; 4 types of gametes; phenotype ratio = 9:3:3:1

**Test Cross:** T<sub>x</sub> tt to determine unknown genotype

### Polygenic Traits



Blending of multiple genes, identified by bell curve distribution

### Di-Hybrid Cross

	<i>AB</i>	<i>Ab</i>	<i>aB</i>	<i>ab</i>
<i>AB</i>	<i>AABB</i>	<i>AABb</i>	<i>AaBB</i>	<i>AaBb</i>
<i>Ab</i>	<i>AABb</i>	<i>AAbb</i>	<i>AaBb</i>	<i>Aabb</i>
<i>aB</i>	<i>AaBB</i>	<i>AaBb</i>	<i>aaBB</i>	<i>aaBb</i>
<i>ab</i>	<i>AaBb</i>	<i>Aabb</i>	<i>aaBb</i>	<i>aabb</i>