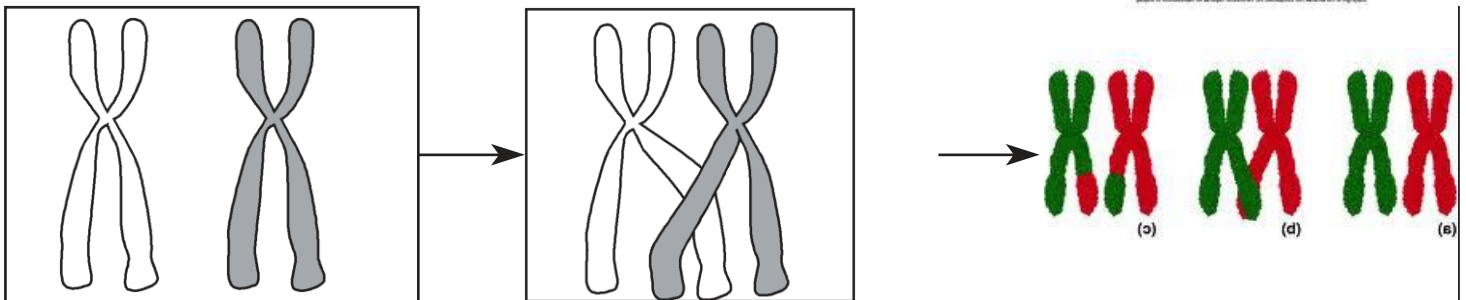


## Genetic Diversity

- **Fertilization:** random; increases unique combinations of genes; in humans, the chance of getting any one combination of chromosomes from any one set of parents is one out of  $2^{23} \times 2^{23}$ , which is one out of over 64 trillion combinations
- **Meiosis:** Independent assortment of chromosomes: increases unique combinations of genes; homologous chromosomes pair randomly along the cell equator; in human cells, about  $2^{23}$ , or 8 million, different combinations of chromosomes could result
- **Crossing Over:** exchange of chromosomes segments between homologous chromosomes during prophase I of meiosis I; creates new combinations of genes; recombined chromosomes are a combination of genes from both the mother and the father  
Figure should look similar to Figure 6.20.

Fill in the final box to illustrate crossing over.



**Genetic Linkage:** genes located close together on same chromosome tend to be inherited together; crossing over less likely to occur between genes located close together; not found by Mendel because he studied traits on separate chromosomes or traits located far apart on the same chromosome; means that not all genes follow the law of independent assortment