

Concepts of Biology

Guided Reading Notes

Chapter 9

1 Inbreeding Leads to Disorders

- Closely related individuals are likely to pass on _____, _____, resulting in genetic disorders

2 Gregor Mendel Deduced Laws of Inheritance

9.1 A blending model of inheritance existed prior to Mendel

- Explain that earlier model: _____
_____.

9.2 Mendel designed his experiments well

- The garden pea was an excellent experimental organism because:
 - 1.
 - 2.
 - 3.
- Explain Mendel's **particulate theory of inheritance** _____

_____.

3 Single-Trait Crosses Reveal Units of Inheritance and the Law of Segregation

9.3 Mendel's law of segregation describes how gametes pass on traits

- An individual has two factors for each _____, which separate during _____ formation so that each gamete contains only _____ factor from each _____.
- Therefore, $Tt \times Tt$ gives these results: (use diagrams on p. 179 to complete these boxes)

Gametes
$T =$
$t =$

Phenotypic Ratio

9.4 The units of inheritance are alleles of genes

- Each trait has two _____, and the _____ **allele** masks expression of the _____.
- A **homozygous organism** _____.
- A **heterozygous organism** _____.
- **Genotype** refers to _____.
- **Phenotype** refers to _____.

4 Two-Trait crosses Support the Law of Independent Assortment

9.5 Mendel's law of independent assortment describes inheritance of multiple traits

- Each pair of factors _____.
 - All possible combinations of factors can _____.
- For Example: **if $TtGg \times TtGg$** then: (use diagrams on p. 179 to complete these boxes)

Gametes

Phenotypic Ratio

9.6 Mendel's results are consistent with the laws of probability

- The probability of **genotypes** and **phenotypes** can be calculated using a _____.

9.7 Testcrosses support Mendel's laws and indicate the genotype

- A **heterozygous** individual crossed with a **homozygous recessive** individual produces _____.
- A _____ - _____ testcross determine whether a dominant phenotype is _____.
- An individual heterozygous for two traits crossed with an individual recessive for those traits results in _____ phenotypic ratio.

5 Mendel's Laws Apply to Humans

9.8 Pedigrees can reveal the patterns of inheritance

- Pedigrees show the patterns of inheritance for particular conditions:
When a trait is **recessive**, the child _____.
When a trait is **dominant**, the child _____.

- Carriers appear normal but _____.

9.9 Some human genetic disorders are autosomal recessive

All of the following conditions/diseases are examples of **autosomal recessive** disorders controlled by _____:

- 1.
- 2.
- 3.
- 4.

9.10 Some human genetic disorders are autosomal dominant

All of the following conditions/diseases are examples of **autosomal dominant** disorder controlled by _____:

- 1.
- 2.
- 3.

9.11 Genetic disorders may now be detected early on

- _____ and _____ sampling test fetal cells.
- An embryonic cell can be tested following _____ prior to _____.
- An egg can be tested for _____ prior to _____.

6 Complex Inheritance Patterns Extend the Range of Mendelian Analysis

9.12 Incomplete dominance still follows the law of segregation

- In incomplete dominance, a _____ has the intermediate phenotype between either _____ (e.g. pink color in four o'clocks)
- In the **F₂ generation**, _____.

9.13 A gene may have more than two alleles

- Multiple alleles control a trait when _____.
- The inheritance of **ABO blood group** in humans is an example of _____.

9.14 Several genes and the environment can influence a single multifactorial characteristic

- In **polygenic inheritance**, a trait is governed by _____, and continuous _____ results in a _____.
(use diagram on p. 180 to illustrate polygenic inheritance)



- Multifactorial traits are controlled by _____ subject to _____.

9.15 One gene can influence several characteristics

- **Pleiotropy** occurs when _____, and often lead to a _____ . (use diagram on p. 180 to illustrate Pleiotropy)



7 Chromosomes Are the Carriers of Genes

9.16 Traits transmitted via the X chromosome have a unique pattern of inheritance

- _____ have been used to demonstrate _____, and the results are _____ to humans.

9.17 Humans has X-linked disorders

- **X-linked recessive** disorder in humans include:
 - 1.
 - 2.
 - 3.
- An x-linked recessive pedigree indicates that the trait can pass from _____ through a carrier _____ to a _____.

9.18 The genes on one chromosome form a linkage group

- Genes on the same chromosome that tend to be inherited together are known as _____.

9.19 Frequency of recombinant gametes maps the chromosomes

- A direct relationship exists between the _____ and the _____. (1% recombinants = 1 map unit).