

Complex Inheritance and Human Heredity

Before You Read

Use the “What I Know” column to list the things you know about human heredity and genetics. Then list the questions you have about these topics in the “What I Want to Find Out” column.

K What I Know	W What I Want to Find Out	L What I Learned

Science Journal

Describe how you think a child’s DNA is different from his or her mother’s DNA and father’s DNA.

Complex Inheritance and Human Heredity

Section 11.1 Basic Patterns of Human Inheritance

Main Idea

Details

Skim and Scan Section 1 of the chapter. Use the checklist as a guide.

- Read all section titles.
- Read all boldfaced words.
- Read all tables and graphs.
- Look at all pictures and read the captions.
- Think about what you already know about patterns of heredity and human genetics.

Write three facts you discovered about patterns of heredity and human genetics as you scanned the section.

1. _____
2. _____
3. _____

Review Vocabulary

Use your book or dictionary to define genes.

genes

New Vocabulary

Use your book or dictionary to define each vocabulary term.

carrier

pedigree

Explain why pedigrees are needed to identify the carriers of a recessive trait in a family.

Academic Vocabulary

Define decline to show its scientific meaning.

decline

Section 11.1 Basic Patterns of Human Inheritance (continued)

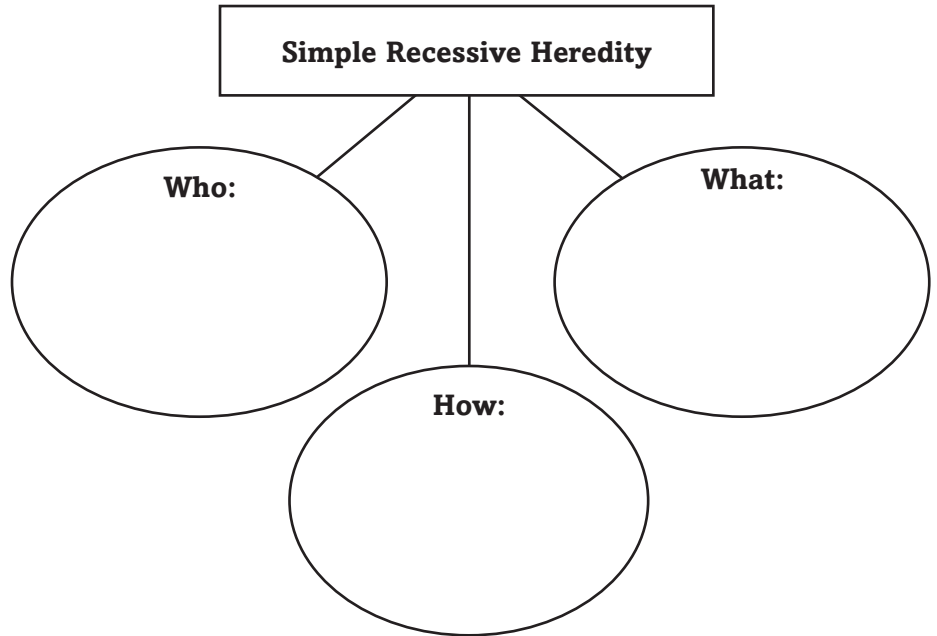
Main Idea

Recessive Genetic Disorders

I found this information on page _____.

Details

Write three facts about recessive heredity in the concept map.



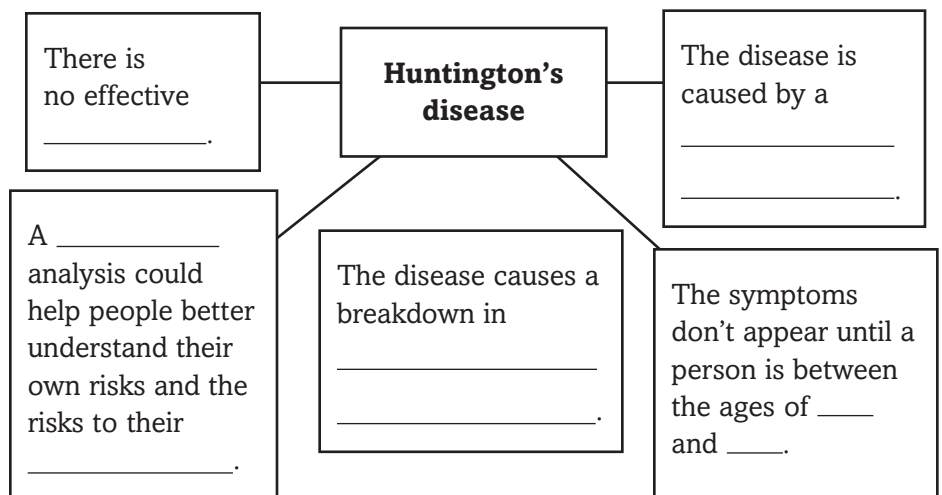
Dominant Genetic Disorders

I found this information on page _____.

Identify two examples of dominant genetic disorders in humans.

dominant genetic disorders

Summarize the facts about Huntington's disease by completing the concept map below.



Section 11.1 Basic Patterns of Human Inheritance (continued)

Main Idea

Details

Pedigrees

I found this information on page _____.

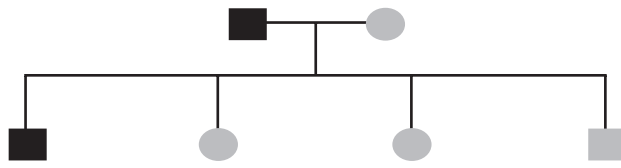
Summarize pedigree symbols by naming them and then drawing them in the right-hand column of the table. Sketches should resemble those in the book.

	Description of Symbol	Sketch of Symbol
male	square	

Analyzing Pedigrees

I found this information on page _____.

Evaluate the inheritance of achondroplasia shown in the pedigree.



Parent with achondroplasia: _____

Number of children with achondroplasia: _____

Genotype of the younger son: _____

CONNECT

Create a pedigree diagram for an imaginary family. Pick a trait and designate it as dominant, then shade the boxes to show who has recessive genes, who has dominant genes, and who is likely heterozygous.

Complex Inheritance and Human Heredity

Section 11.2 Complex Patterns of Inheritance

Main Idea

Details

Skim Section 2 of the chapter. Write two questions that come to mind from reading the headings and illustration captions.

1. _____

2. _____

New Vocabulary

Use your book or dictionary to define gamete.

gamete

New Vocabulary

Use your book or dictionary to define each term.

autosomes

codominance

epistasis

incomplete dominance

multiple alleles

polygenic trait

sex chromosomes

sex-linked traits

Section 11.2 Complex Patterns of Inheritance (continued)

Main Idea

Incomplete Dominance

I found this information on page _____.

Details

Analyze the ratios of offspring of the following snapdragon pairs. *Hint: To write the genotypes, designate the dominant red allele as R and the recessive white allele as r.*

Parent Flowers	Genotypes of Parent Flowers	Punnett Square	Ratio of Offspring									
red and white	$RR \times rr$	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td></td> <td>R</td> <td>R</td> </tr> <tr> <td>r</td> <td>Rr</td> <td>Rr</td> </tr> <tr> <td>r</td> <td>Rr</td> <td>Rr</td> </tr> </table>		R	R	r	Rr	Rr	r	Rr	Rr	4 pink
	R	R										
r	Rr	Rr										
r	Rr	Rr										
pink and white	×	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table>										
red and pink	×	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table>										
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Codominance

I found this information on page _____.

Predict the results if two people who are heterozygous for sickle-cell anemia but lead normal lives have a child.

Multiple Alleles

I found this information on page _____.

Identify the blood group that results from each combination of genotypes. The first one has been done for you.

Possible Genotype Combinations	Phenotypes
A and A	A
A and B	
A and O	
B and B	
B and O	
O and O	

Section 11.2 Complex Patterns of Inheritance (continued)

Main Idea

Epistasis, Sex Determination, Dosage Compensation, Sex-Linked Traits, and Polygenic Traits

I found this information on page _____.

Environmental Influences

I found this information on page _____.

Twin Studies

I found this information on page _____.

Details

Analyze the role of each item in inheritance. Give an example of a trait governed by each process.

	Role in Inheritance	Example
Epistasis		
Polygenic traits		
X-chromosome inactivation		
X-linked traits		

Identify environmental influences that can affect phenotype.

External factors	Behaviors
1.	1.
2.	2.

Describe the use of twin studies in the study of genetics by completing the paragraph.

Scientists use twin studies to distinguish between _____ and _____ influences on a trait. If a high percentage of _____ but not _____ express a trait, there is a strong chance that the trait is _____.

CONNECT

Think of some traits in people, plants, or animals. Describe one trait and tell whether you think the trait is a dominant/recessive, multiple allele, codominant, incompletely dominant, sex-linked, or polygenic trait. Explain your reasoning.

Complex Inheritance and Human Heredity

Section 11.3 Chromosomes and Human Heredity

Main Idea

Details

Organize Information *Make a list of some physical characteristics that appear in your family members or friends. Try to determine how each trait is inherited by examining its inheritance pattern.*

Review Vocabulary

Use your book or dictionary to define mitosis.

mitosis

New Vocabulary

Use your book or dictionary to define the following terms.

nondisjunction

telomere

Define karyotype and describe its use. Then make a sketch of a human karyotype in the space below.

karyotype

Section 11.3 Chromosomes and Human Heredity (continued)

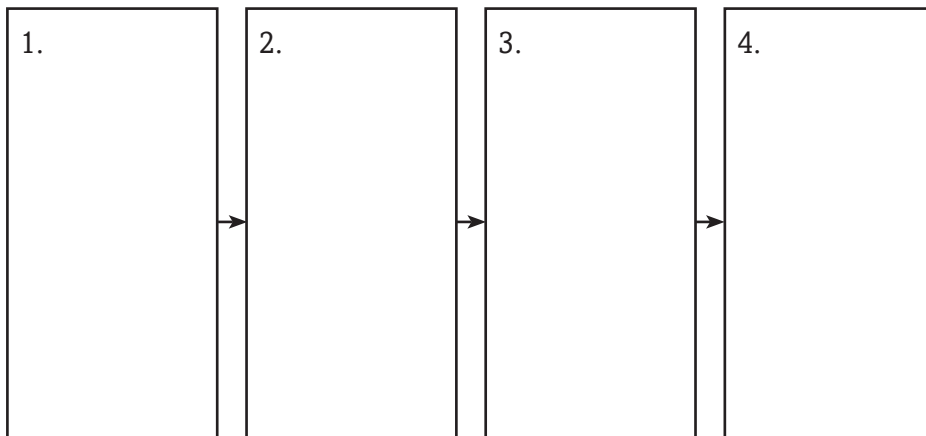
Main Idea

Details

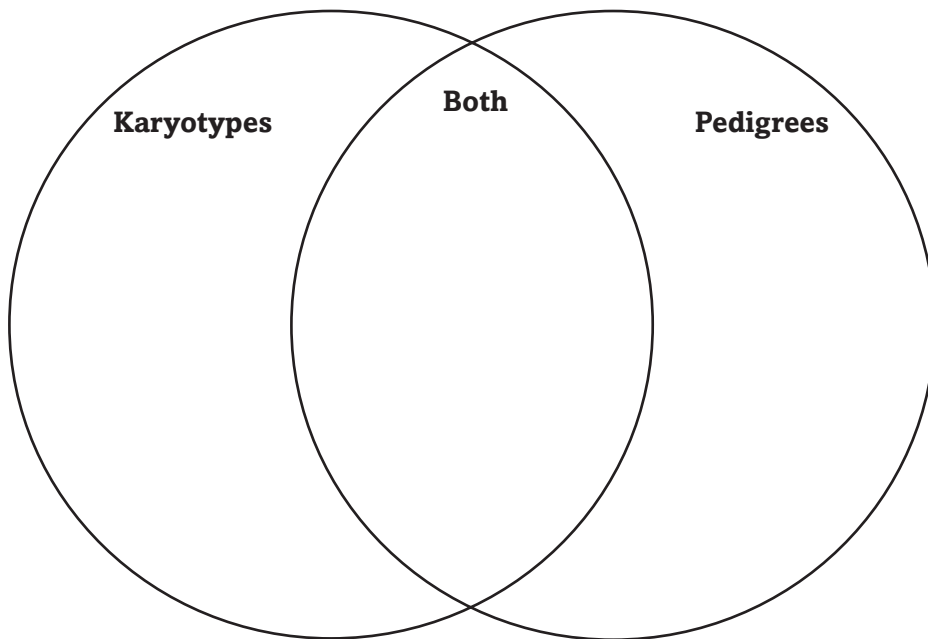
Karyotype Studies

I found this information on page _____.

Sequence *how a scientist makes a karyotype.*



Compare and contrast *karyotype studies and pedigrees by writing characteristics in the Venn diagram.*



Telomeres

I found this information on page _____.

Describe *telomeres by completing the paragraph.*

Telomeres are made of _____ and _____. They are located at _____. Their function is _____.

Section 11.3 Chromosomes and Human Heredity

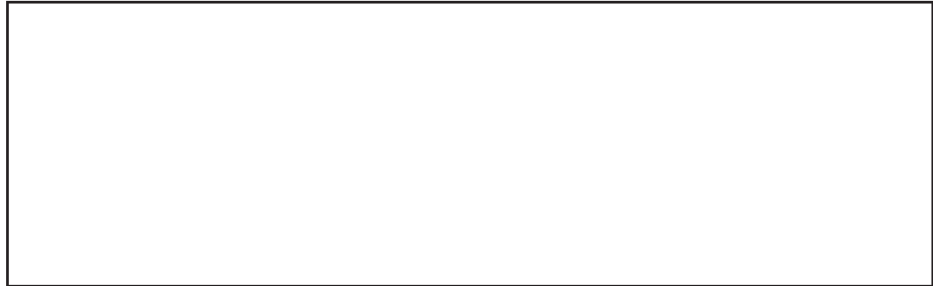
Main Idea

Nondisjunction

I found this information on page _____.

Details

Model a picture showing the ways that nondisjunction during meiosis can produce a sex cell with an extra copy of a chromosome.



Model a karyotype of a boy with Down's syndrome.



Fetal Testing

I found this information on page _____.

Summarize the following facts about fetal testing.

- how an abnormal number of chromosomes is identified
- four possible results of abnormal chromosome numbers

SUMMARIZE

Analyze how nondisjunction during meiosis could lead to Klinefelter's syndrome.
