Biology

S/W/849

Name _____

Period_____

Chapter - Fundamentals of Genetics

Genetics is the branch of biology that deals with heredity in living organisms. It examines how characteristics are passed to successive generations. It also examines how variations in such characteristics can be predicted. Recent discoveries in genetics make it perhaps the most exciting of all biological specialties.

A. Write the letter of the correct definition in the blank beside each vocabulary term.

_____	1. heterozygous	A. a chart used to determine the probable outcome of a genetic cross
_____	2. allele	B. the genetic makeup of pairs of alleles in the cells of an organism
_____	3. genotype	C. a single member of a pair of genes, responsible for a single trait
_____	4. phenotype	D. phenotype caused by one dominant and one recessive gene
_____	5. Punnett square	E. a genetic trait expressed by an organism

B. Complete the following paragraph using vocabulary terms in the box.

dominant	chromosomes
homozygous	allele
recessive	genes

Discovered well after Gregor Mendel finished his genetic research, the rod-shaped structures in the nucleus of a cell are (1) _____. They contain the (2) _____, which carry hereditary information. A single member of a pair of genes is an (3) _____. This unit, when described by a lower-case letter, is said to be (4) _____. One described by a capital letter is (5) _____. A genotype comprising two identical alleles is known as a (6) _____ genotype.

C. Explain the following.

1. Mendel's work on genetics.

2. How do you explain the difference between **genetics** and **genes**?

(over)

3. Describe the Principle of Dominance.

4. Explain the Principle of Segregation.

5. Explain the Principle of Independent Assortment.

6. How are **homozygous** and **pure** similar?

7. How are **heterozygous** and **hybrid** similar?

8. What is the difference between **genotype** and **phenotype**?

9. Explain *filial generation*.

10. How is the Punnett square used in the study of genetics?

11. What is the difference between a one-factor cross and a two-factor cross?

Biology Genetics Name: _____

1. Using the recessive traits for albinism and cystic fibrosis, do the following crosses. Use a punnett square to show the traits.

I. AaCc x aaCc

How many show the trait for
Albinism:_____
Cystic Fibrosis:_____

II. AaCc x AaCc

How many show the trait for

Albinism:_____

III. aacc x aaCc

How many show the trait for

Cystic fibrosis:_____

2. If Brown eyes (B) is dominant over red eyes (b) and winged (W) is dominant over wingless (w), what is the outcome when a homozygous female crosses with a heterozygous male? (use a punnett square)

Genotypic ratio:_____

Phenotypic ratio:_____

3. If smooth (S) is dominant to wrinkle (s) and yellow (Y) is dominant to green (y), what happends when a homozygous smooth green pea plant is crossed with a homozygous wrinkled yellow pea plant?

Genotypic Ratio:_____

Phenotypic Ratio:_____

BASIC BIOLOGY
Punnett Squares II

Name_____
Hr._____

1. In peas, tallness is dominant over shortness. If a hybrid tall plant is crossed to a short plant, what types of offspring could result?

	T	t
t		
t		

What % of the offspring will be tall? _____

What % of the offspring will be short? _____

2. In people, skin with normal pigment is dominant over albino skin. If an albino man marries a normal woman who is hybrid for this trait, what could their children be like?

	a	a
A		
a		

What % of the offspring will be albino? _____

What % of the offspring will be normal? _____

3. In rabbits, rough (R) fur is dominant over smooth (r) fur. Set up a cross and show the results between a pure rough rabbit with a rough female that is hybrid.

What % of the offspring will be rough? _____

What % of the offspring will be smooth? _____

How many different genotypes are indicated? _____

How many different phenotypes are indicated? _____

4. In guinea pigs, the gene for black coat is dominant over the gene for a white coat. Use a "B" to represent a gene for black hair and "b" to represent a gene for white hair. Cross a female guinea pig that has the genes Bb with a male with the genes bb.

What % of the offspring will be black? _____

What % of the offspring will be white? _____

What % of the offspring will be hybrid? _____

How many different genotypes are indicated? _____

How many different phenotypes are indicated? _____

5. Show the results of a cross between 2 people that are both hybrid for brown eyes. What will the offspring be like?