

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Punnett Squares

What does DNA contain? \_\_\_\_\_

Where is the information carried in the DNA? \_\_\_\_\_

Define **gene** \_\_\_\_\_

Define **genotype** \_\_\_\_\_

How many different chromosomes do humans have? \_\_\_\_\_ How many of each? \_\_\_\_\_

How many total chromosomes do humans have? \_\_\_\_\_

What do we call the first 22 pairs of chromosomes? \_\_\_\_\_

What do we call the 23<sup>rd</sup> pair of chromosomes? \_\_\_\_\_

What karyotype do males have? \_\_\_\_\_ What karyotype do females have? \_\_\_\_\_

Define **allele** \_\_\_\_\_

Define **phenotype** \_\_\_\_\_

What are the two types of genes? \_\_\_\_\_

Define **expressed** \_\_\_\_\_

What type of gene is always expressed? \_\_\_\_\_

What type of gene is only expressed some of the time? \_\_\_\_\_

What does **homo-** mean? \_\_\_\_\_ What does **hetero-** mean? \_\_\_\_\_

What does **-zygous** mean? \_\_\_\_\_

Define **homozygous** \_\_\_\_\_

Define **heterozygous** \_\_\_\_\_

Circle the following genotype(s) that are **homozygous**:    **GG**    **Gg**    **gg**

Circle the following genotype(s) that are **heterozygous**:    **GG**    **Gg**    **gg**

**Use the information in the table below to answer the following questions.**

1. What is the genotype of an animal that is homozygous dominant for eye color? \_\_\_\_\_  
What would this animal's phenotype be?  
\_\_\_\_\_

2. What is the genotype of an animal that is homozygous recessive for eye color? \_\_\_\_\_  
What would this animal's phenotype be?  
\_\_\_\_\_

Allele	Trait	Type
G	Solid gray fur	Dominant
g	Striped gray fur	Recessive
B	Green eyes	Dominant
b	Blue Eyes	Recessive
T	Long tail	Dominant
t	Short tail	Recessive
E	Large ears	Dominant
e	Small ears	Recessive

3. What is the genotype of an animal that is heterozygous for eye color? \_\_\_\_\_

What would this animal's phenotype be? \_\_\_\_\_

4. What is the genotype of an animal that is homozygous for solid gray fur? \_\_\_\_\_

What would this animal's phenotype be? \_\_\_\_\_

5. What is the genotype of an animal that is homozygous for striped gray fur? \_\_\_\_\_

What would this animal's phenotype be? \_\_\_\_\_

6. What is the genotype of an animal that is heterozygous for fur? \_\_\_\_\_

What would this animal's phenotype be? \_\_\_\_\_

Description	Genotype	Phenotype
Homozygous recessive for tail length		
Heterozygous for ear size		
Homozygous for short tails		
Heterozygous for tail length		
Homozygous for blue eyes		
Homozygous dominant for fur		
Homozygous for striped gray fur		
Heterozygous for eye color		
Homozygous for long tails		

What do we use to predict genotypes and phenotypes? \_\_\_\_\_

Is the placement of the male and female gametes that important? \_\_\_\_\_

What does each box represent? \_\_\_\_\_

\_\_\_\_\_

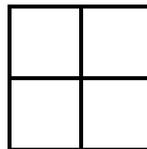
What percentage does each box in a Punnett square represent? \_\_\_\_\_

How else do we describe the outcomes of Punnett squares? \_\_\_\_\_

**Complete the following Punnett squares and answer the questions go with each pair.**

**Use the table of information below to answer questions 1-4.**

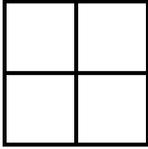
Allele	Trait	Type
G	Green feathers	Dominant
g	Yellow feathers	Recessive
L	Long beak	Dominant
l	Short beak	Recessive



1. Ll (♂) x ll (♀)

What percentage of offspring will have short beaks?

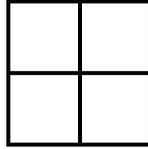
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2.  $LI$  (♂) x  $LI$  (♀)

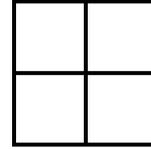
What is the ratio of long beaks to short beaks in the offspring?

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3. Two birds which are **heterozygous for feather color** are crossed. What percentage of offspring will have yellow feathers?

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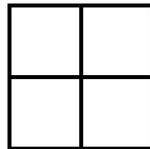
4.  $GG$  (♂) x  $Gg$  (♀)

What percentage of offspring will have green feathers?

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Use this information for questions 5-12 on this page.

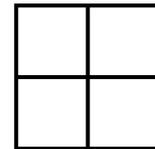
Allele	Trait
T	Tall
t	Short
S	Smooth peas
s	Wrinkled peas
P	Purple flowers
p	White flowers



6.  $Pp$  (♂) x  $pp$  (♀)

What will be the ratio of purple flowers to white flowers in the offspring?

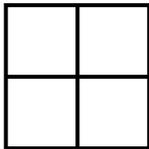
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5.  $Ss$  (♂) x  $Ss$  (♀)

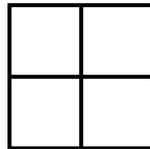
What percentage of offspring will have wrinkled peas?

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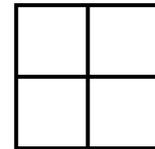
7. A plant which is homozygous for smooth peas is crossed with a plant that is homozygous for wrinkled peas. What percentage of offspring will have smooth peas?

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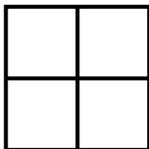
8. A plant which is homozygous short is crossed with a plant that is heterozygous for height. What will be the ratio of tall plants to short plants in the offspring?

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9. A plant which is heterozygous for flower color is crossed with a plant that is also heterozygous for flower color. What will be the ratio of purple flowers to white flowers in the offspring?

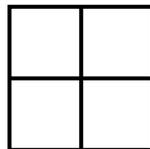
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10.  $Tt$  (♂) x  $Tt$  (♀)

What percentage of offspring will be tall?

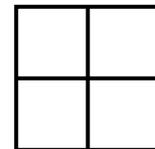
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11.  $SS$  (♂) x  $ss$  (♀)

What percentage of offspring will be heterozygous?

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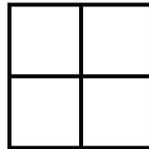
12.  $Pp$  (♂) x  $Pp$  (♀)

What will be the ratio of purple flowers to white flowers in the offspring?

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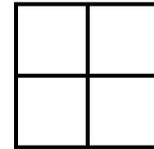
Use this information for questions 13-23 on this page.

Allele	Trait
R	red eyes
r	brown eyes
W	large wings
w	small wings
B	brown body
b	yellow body



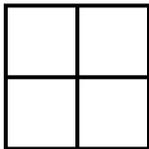
13. An insect which is heterozygous for body color is crossed with an insect that has a yellow body. What will be the ratio of brown bodies to yellow bodies in the offspring?

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14. Two insects which are heterozygous for wing size are crossed. What percentage of offspring will have small wings?

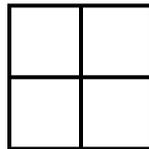
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15.  $Rr$  (♂) x  $RR$  (♀)

What percentage of offspring will have brown eyes?

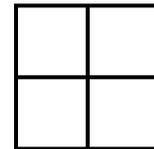
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16.  $WW$  (♂) x  $Ww$  (♀)

What percentage of offspring will have a heterozygous genotype?

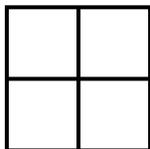
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17.  $BB$  (♂) x  $bb$  (♀)

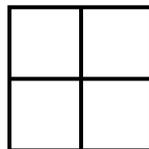
What percentage of offspring will have yellow bodies?

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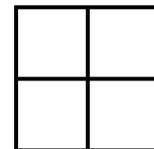
18. An insect which is homozygous recessive for eye color is crossed with an insect that is heterozygous for eye color. What percentage of offspring will have red eyes?

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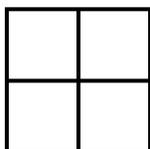
19. An insect which is heterozygous for wing size is crossed with an insect that is homozygous for small wings. What will be the ratio of large to small wings in the offspring?

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20. An insect with brown eyes is crossed with an insect that is homozygous for red eyes. What percentage of insects will have red eyes?

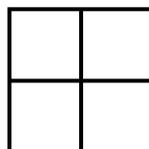
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21.  $ww$  (♂) x  $Ww$  (♀)

What percentage of offspring will have large wings?

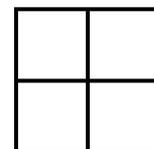
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22.  $Bb$  (♂) x  $Bb$  (♀)

What percentage of offspring will have brown bodies?

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23.  $Rr$  (♂) x  $rr$  (♀)

What will be the ratio of red eyes to brown eyes in the offspring?

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