

GENETICS

UNIT

Review

1

GENETICS PROBLEMS

Different versions of a single gene are called _____, and one can be dominant over the other(s).



2

GENETICS PROBLEMS

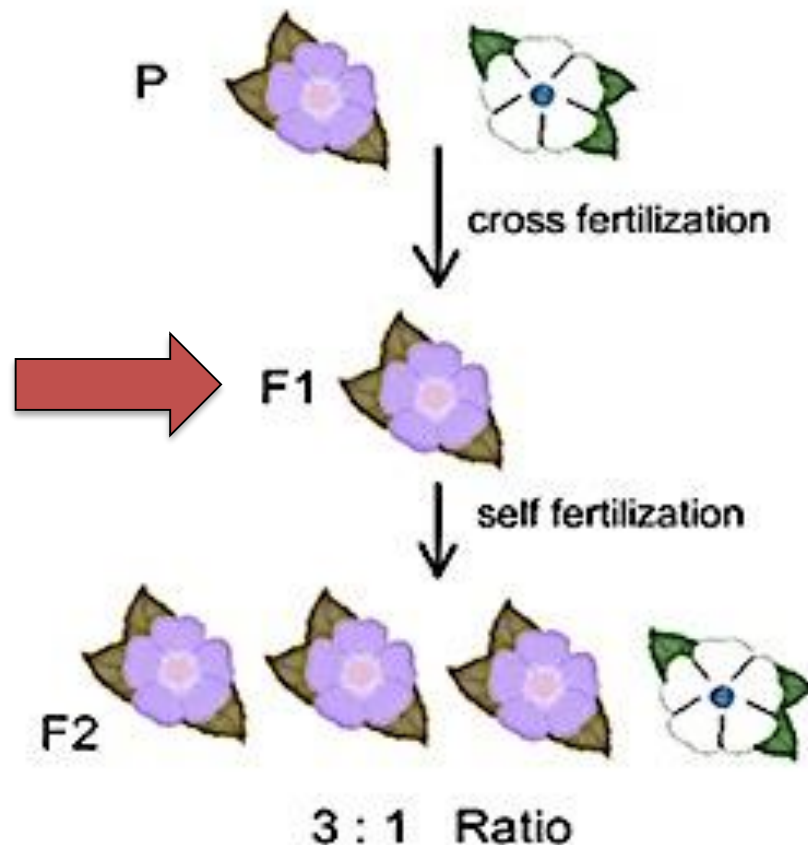
- Describe “genotype” and “phenotype” in your own words.
- How are the two terms related?



3

GENETICS PROBLEMS

Draw a Punnett square depicting the cross of the F1 generation of Mendel's pea plant experiments.



4

GENETICS PROBLEMS

In Rabbits, the allele B for black hair is dominant over the allele b for brown hair.

Calculate the probability of homozygous dominant offspring resulting from a cross between two heterozygous parents.

Show Your Work With a
Punnett Square!



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GENETICS PROBLEMS

In horses, the allele C for a chestnut coat is dominant to the allele c a gray coat. Calculate the probability of heterozygous offspring resulting from a cross between a heterozygous parent and a homozygous recessive parent.



Show Your Work With a
Punnett Square!

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GENETICS PROBLEMS

In horses, the allele C for a chestnut coat is dominant to the allele c a gray coat. A heterozygous stallion and a heterozygous mare have produced three chestnut foals. What is the chance that their next foal will also be chestnut?



Show Your Work With a Punnett Square!

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GENETICS PROBLEMS

In eggplant, the allele P for purple eggplants are dominant over the allele p for white eggplants.

Calculate the probability of heterozygous offspring resulting from a cross between a homozygous dominant parent and a homozygous recessive parent.



Show Your Work With a
Punnett Square!

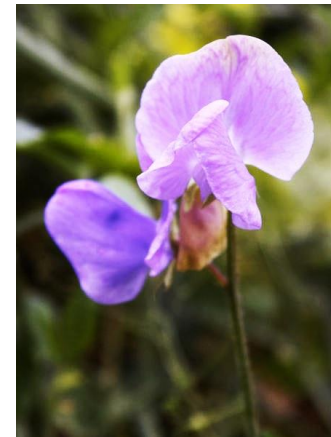
8

GENETICS PROBLEMS

In pea plants, the allele T for tall pea plants is dominant to the allele t for short plants.

Calculate the probability of homozygous dominant offspring from a cross between a heterozygous parent and a homozygous recessive parent.

Show Your Work
With a Punnett
Square!



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GENETICS PROBLEMS

If a brown-eyed woman's father has blue eyes, and her mother has brown eyes, she is most likely _____[homozygous | heterozygous] for the eye color trait.



10

GENETICS PROBLEMS

In dragons, yellow eyes are dominant to green eyes. Two yellow-eyed dragons mate, and produce three eggs. Of the three hatchlings, one has green eyes.

What are the genotypes of the parent dragons?



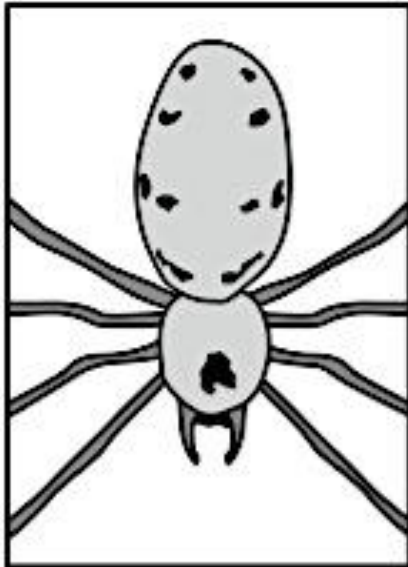
Show Your Work With a
Punnett Square!

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GENETICS PROBLEMS

In Hawaiian Happy Face Spiders, the patterned allele is dominant to the plain allele.

Plain Spider



Patterned Spider



A plain spider is crossed with a patterned spider. The patterned spider is heterozygous.

Which genotypes are produced among the offspring and in what ratio?

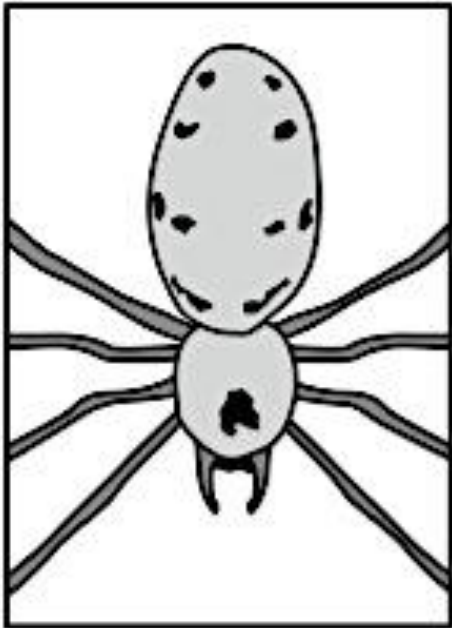
Which phenotypes are produced and in what ratio?

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GENETICS PROBLEMS

In Hawaiian Happy Face Spiders, the patterned allele is dominant and the plain allele is recessive.

Plain Spider



Patterned Spider

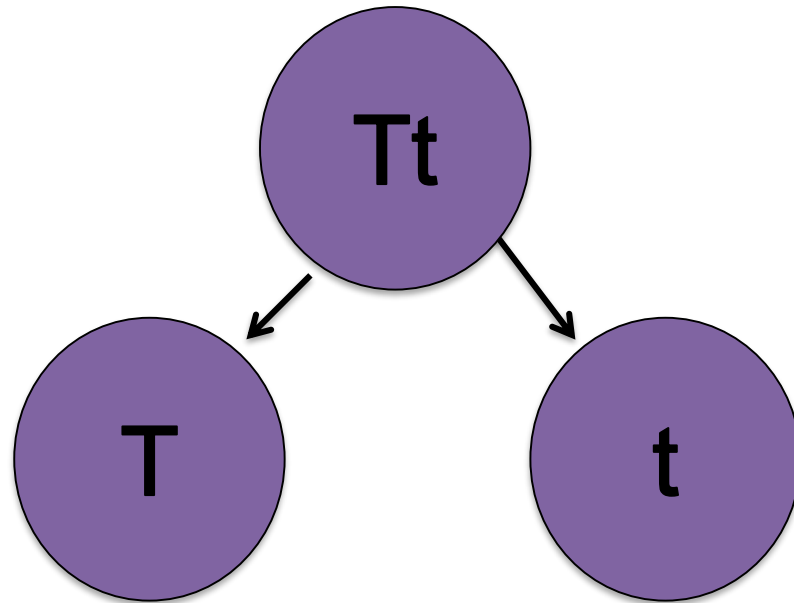


Two patterned heterozygous spiders are crossed. 600 offspring are produced. How many of them are plain?

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GENETICS PROBLEMS

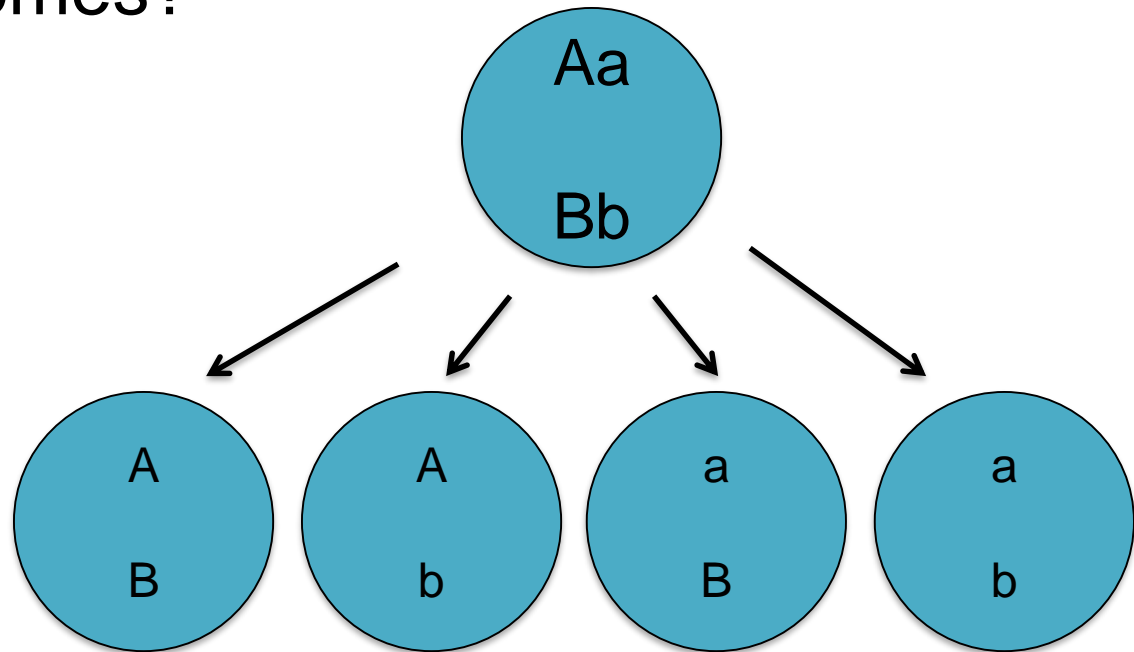
Which of Mendel's Laws states that the members of each pair of alleles separate when gametes are formed?



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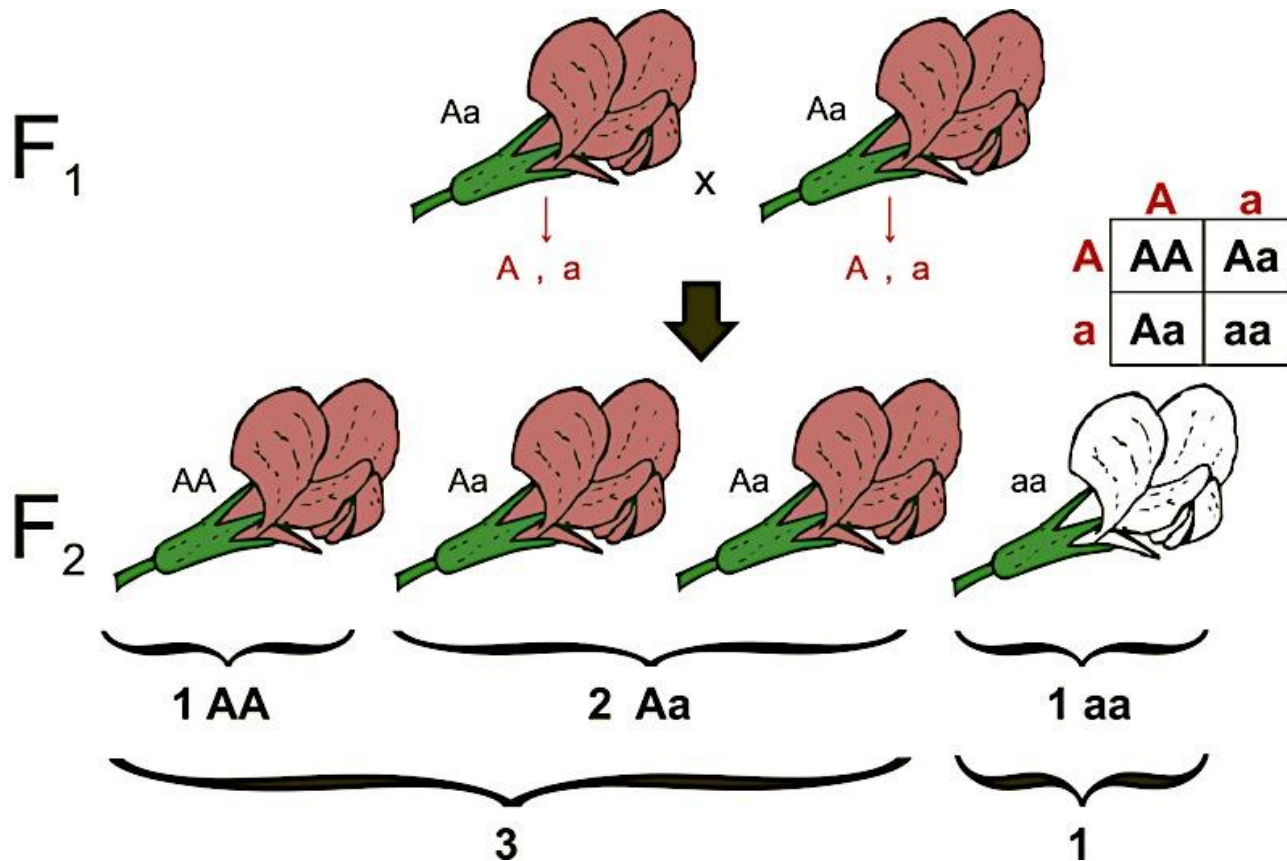
GENETICS PROBLEMS

Which Mendel's Law states that **two or more** pairs of alleles segregate independently of one another during gamete formation, creating at least four different outcomes?



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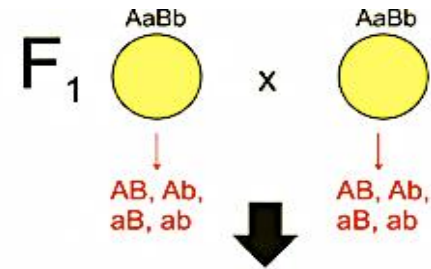
GENETICS PROBLEMS























Which of Mendel's laws does this illustration represent?

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GENETICS PROBLEMS

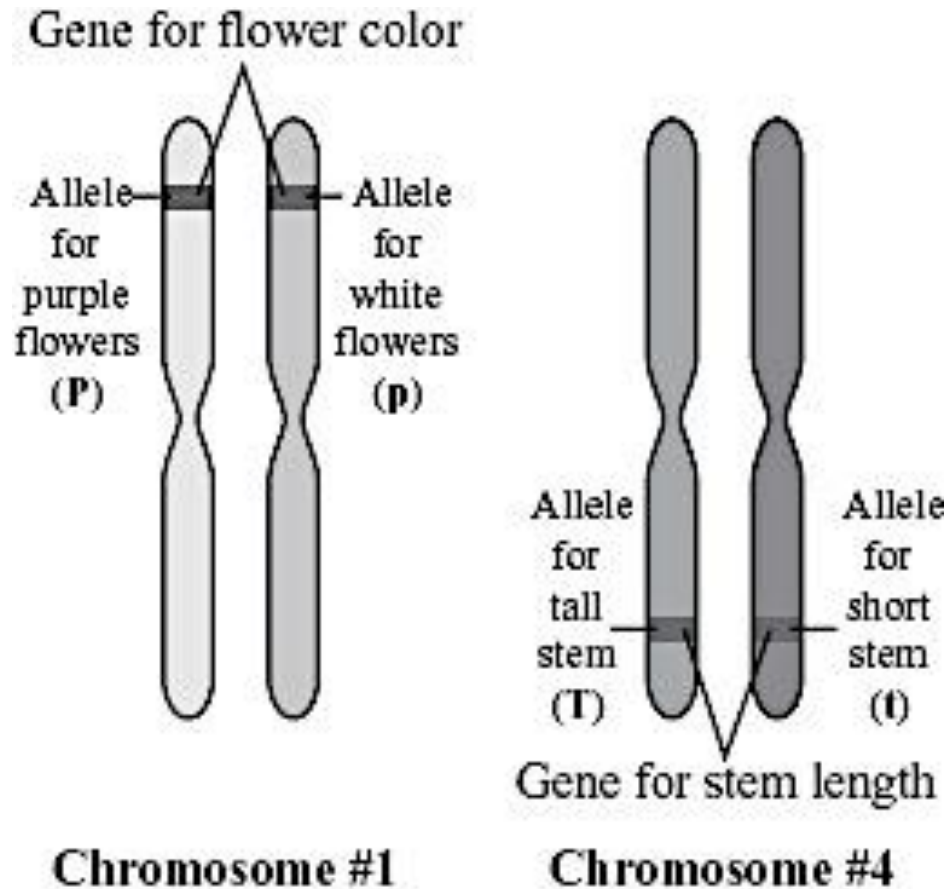


Which of Mendel's laws does this illustration represent?

F_2	AB	Ab	aB	ab
AB	 $AABB$	 $AABb$	 $AaBB$	 $AaBb$
Ab	 $AABb$	 $AAbb$	 $AaBb$	 $Aabb$
aB	 $AaBB$	 $AaBb$	 $aaBB$	 $aaBb$
ab	 $AaBb$	 $Aabb$	 $aaBb$	 $aabb$
9  : 3  : 3  : 1 				

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GENETICS PROBLEMS



The diagram shows the positions of the genes for flower color and stem length in a pea plant. The chromosomes represented below will replicate before meiosis.

For these two genes, what is the maximum number of different allele combinations that can be formed normally in gametes produced from this cell?

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GENETICS PROBLEMS

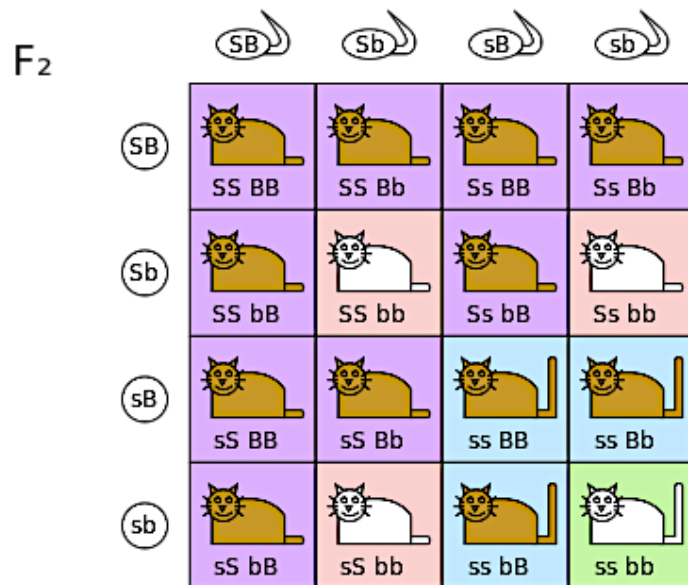
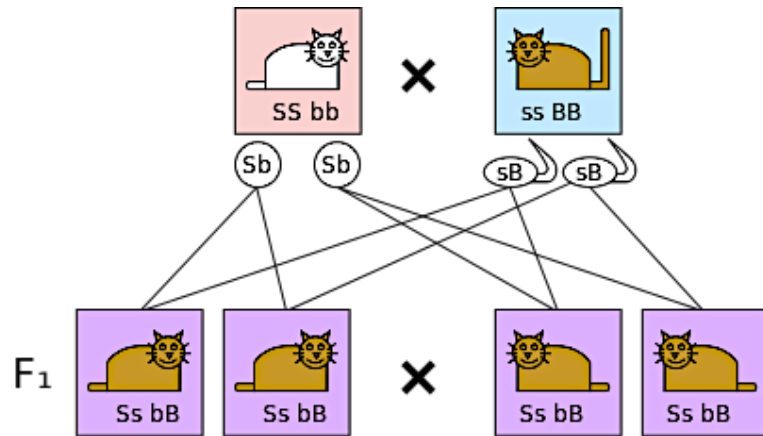
In Alaskan malamutes, the dwarf allele is recessive (d), while the normal allele is dominant (D). Show a test cross in which all of the offspring are phenotypically dominant.

Show Your Work With a
Punnett Square!



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GENETICS PROBLEMS



Which type of cross is demonstrated in this Punnett square?

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GENETICS PROBLEMS

In guinea pigs, the allele S for short hair is dominant over the allele s for long hair. Also, the allele B for black hair is dominant over the allele b for brown hair. Which ratio of offspring are expected to be short haired and brown from a cross of two guinea pigs that are both heterozygous for each trait?



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GENETICS PROBLEMS

Describe the difference in phenotypes between organisms that exhibit incomplete dominance for a trait vs. organisms that exhibit codominance for a trait.



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GENETICS PROBLEMS

Hair texture typically is incompletely dominant, and can be curly (C), straight (S) or wavy (SC).

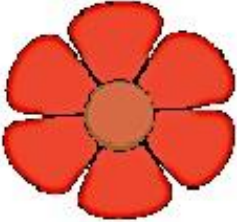


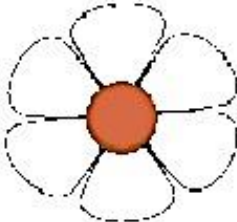
Construct a Punnett square crossing a curly-haired parent with a wavy-haired parent.

Determine all phenotypic and genotypic ratios of the potential offspring.



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GENETICS PROBLEMS

	R	r
R	<div>RR</div> 	<div>Rr</div> 
r	<div>Rr</div> 	<div>rr</div> 

Which pattern of inheritance is depicted in the Punnett square?

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GENETICS PROBLEMS



The rhododendron
pictured here
exhibits which of
inheritance pattern
for the flower petal
color?

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GENETICS PROBLEMS

A cross between a black cat and a tan cat produces a tabby pattern (black and tan fur together).

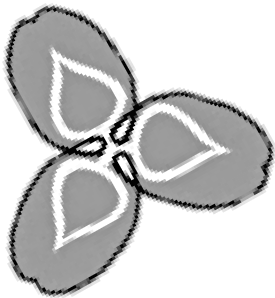
List all the possible phenotypes and in what ratios from a cross between a tabby cat and a black cat.

Show Your Work With a Punnett Square!

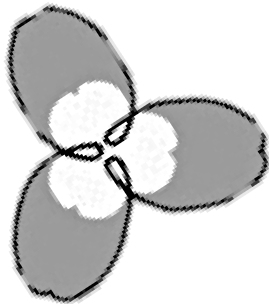


GENETICS PROBLEMS

Plant 1

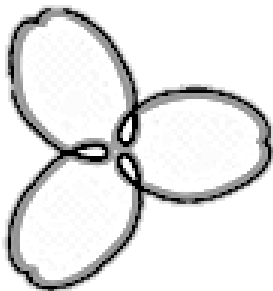


Plant 2

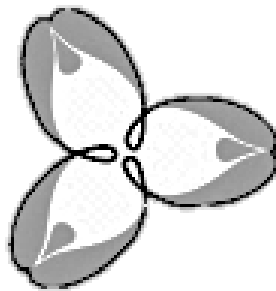


Plant 1 is homozygous for the chevron allele. Plant 2 is homozygous for the oval allele. The chevron and oval alleles are **codominant**.

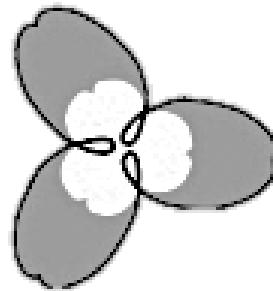
If plant 1 and plant 2 are crossed, the codominance of the alleles will **most likely** result in which of the following leaf patterns on the offspring plants?



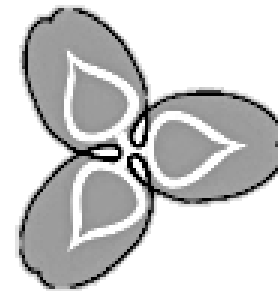
A



B



C



D

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GENETICS PROBLEMS

In humans, there are 3 alleles for blood types: A, B and O. A and B are codominant, resulting in a third blood type, AB. The O blood type is recessive.

If a man who is heterozygous for type B blood marries a woman who has type AB blood, which blood type would their child most likely be?

Show Your Work With a
Punnett Square!