

Sea Lion Genetics



8.L3U3.9

Students will have an understanding of the following vocabulary in order to complete assignment:

homozygous: having two identical alleles for a trait.

heterozygous: having 2 different alleles for a trait.

gene: a section of DNA that codes for a certain trait

allele: a variant of a gene

dominant allele: an allele whose trait always shows up in the organism when the allele is present (written as uppercase letter)

recessive allele: an allele that is masked when a dominant allele is present (written as lower case letter)

genotype: an organism's genetic makeup or allele combinations

phenotype: an organism's physical appearance or visible trait

trait: a characteristic that an organism can pass on to its offspring through its genes

Punnet Square: a diagram used to predict an outcome of a particular cross or breeding experiment

probability: a number that describes how likely it is that an event will occur

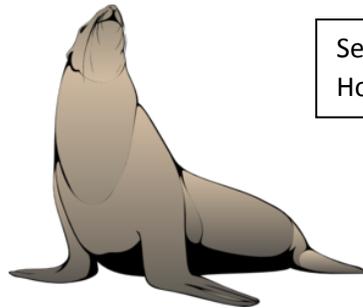
heredity: the passing of traits from parents to offspring

Teacher will discuss with students that the majority of traits are not passed on through only one gene and are frequently more complicated. Students will be able to identify the sea lion bachelor that will provide a pup with the best chance of survival through completion of the Punnett squares.

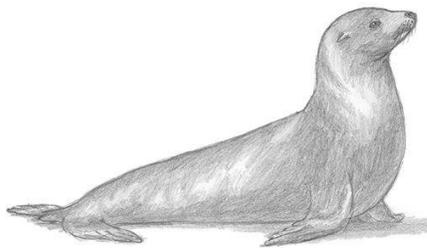
Sea Lion Genetics 1



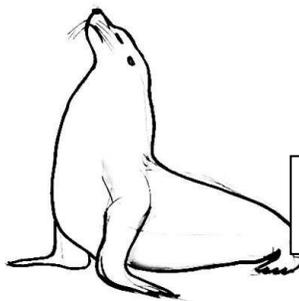
Andi, a female sea lion, is looking for a mate. She needs a mate that gives her offspring the best chance for survival and reproduction. The first trait she is considering is coat color. A male with a normal coat color (B) has a higher chance of survival than a male with an albino coat (b). Albino sea lions stand out both on the beach and in the water and are more likely to become prey. A homozygous recessive sea lion (bb) is albino, a heterozygous animal (Bb) has a normal coat but carries the gene for albinism, and a homozygous dominant sea lion (BB) has a normal coat and cannot pass down albinism to offspring. Complete the Punnett squares and circle the best mate for Andi if she wants the smallest probability of having albino offspring. Andi is a heterozygous female (Bb).



Sea lion bachelor #1
Homozygous dominant (BB)



Sea lion bachelor #2
Heterozygous (Bb)



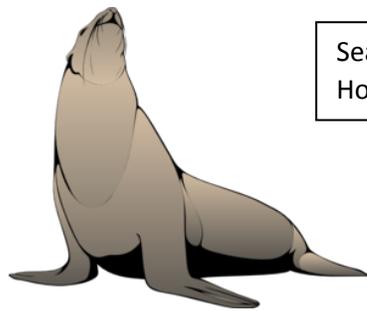
Sea lion bachelor #3
Homozygous recessive (bb)

Sea Lion Genetics 1 Answer Key



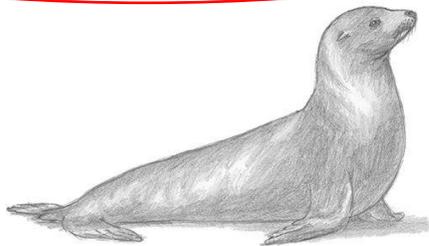
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	B	B
B	BB	BB
b	Bb	Bb



Sea lion bachelor #1
Homozygous dominant (BB)

	B	b
B	BB	Bb
b	Bb	bb

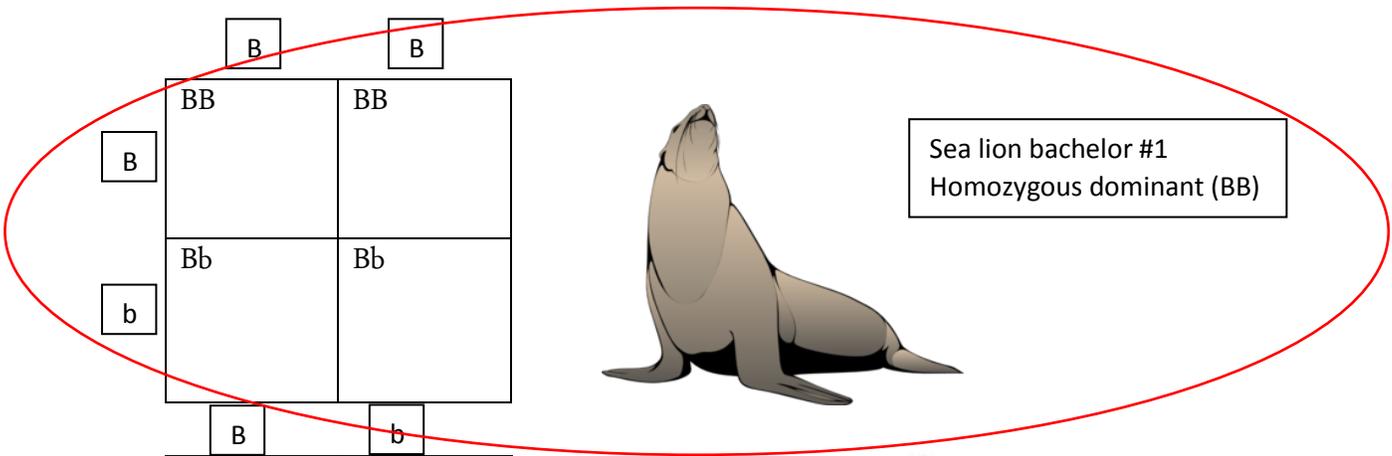


Sea lion bachelor #2
Heterozygous (Bb)

	b	b
B	Bb	Bb
b	bb	bb



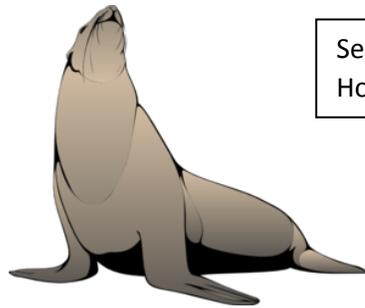
Sea lion bachelor #3
Homozygous recessive (bb)



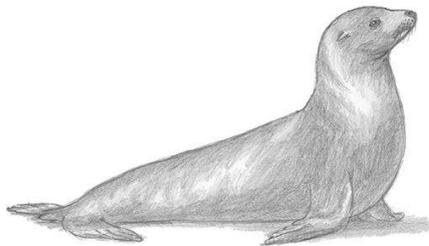
Sea Lion Genetics 2



Andi also wants her offspring to be able to avoid predators. Sea lions with larger front flippers are able to propel themselves through the water quicker. Sea lions that are homozygous dominant have normal flippers (FF). Sea lions that are heterozygous also have normal flippers. Sea lions that are homozygous recessive have longer front flippers and can swim faster (ff). Complete the Punnett squares and decide which mate is best for Andi's offspring. Andi is homozygous recessive for front flipper length (ff).



Sea lion bachelor #1
Homozygous dominant (FF)



Sea lion bachelor #2
Heterozygous (Ff)

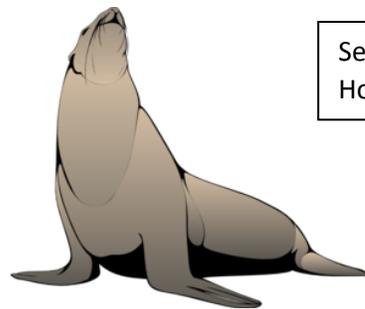


Sea lion bachelor #3
Homozygous recessive (ff)

Sea Lion Genetics 2 Answer Key

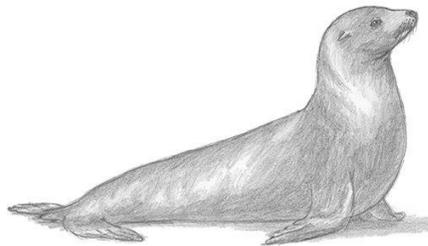
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	F	F
f	Ff	Ff
f	Ff	Ff



Sea lion bachelor #1
Homozygous dominant (BB)

	F	f
f	Ff	ff
f	Ff	ff



Sea lion bachelor #2
Heterozygous (Bb)

	f	f
f	ff	ff
f	ff	ff



Sea lion bachelor #3
Homozygous recessive (bb)

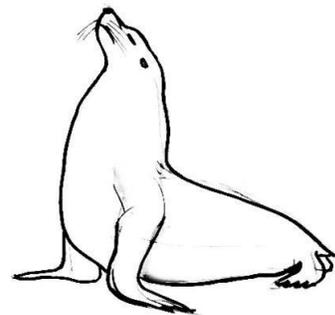
Sea Lion Genetics 3



Andi has 2 bachelor sea lions to choose from. Complete the larger Punnett squares to determine which male will produce the most offspring with BOTH normal coat color and longer front flippers. Andi's alleles are Bbff.



Sea lion bachelor #1
BBFF



Sea lion bachelor #2
bbff

Sea Lion Genetics 3 Answer Key



Andi has 2 bachelor sea lions to choose from. Complete the larger Punnett squares to determine which male will produce the most offspring with BOTH normal coat color and longer front flippers. Andi's alleles are Bbff.

	BF	BF	BF	BF
Bf	BBFf	BBFf	BBFf	BBFf
Bf	BBFf	BBFf	BBFf	BBFf
bf	BbFf	BbFf	BbFf	BbFf
bf	BbFf	BbFf	BbFf	BbFf



Sea lion bachelor #1
BBFF

	bf	bf	bf	bf
Bf	Bbff	Bbff	Bbff	Bbff
Bf	Bbff	Bbff	Bbff	Bbff
bf	bbff	bbff	bbff	bbff
bf	bbff	bbff	bbff	bbff



Sea lion bachelor #3
bbff