

Oompa Loompa Genetics



Oompa Loompa Genetics

1. Oompas generally have blue faces which is caused by a dominant gene. The recessive condition results in an orange face. Develop a "key" to show the genotypes and phenotypes possible for Oompa Loompas.

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1. Oompas generally have blue faces which is caused by a dominant gene. The recessive condition results in an orange face. Develop a "key" to show the genotypes and phenotypes possible for Oompa Loompas.

Answer: **B** dominant Blue face allele

b recessive orange face allele

BB, Bb blue face

bb orange face

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2. Two heterozygous Oompas are crossed. What proportion of the offspring will have orange faces.



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$\frac{1}{4}$ will have orange faces

		<u>B</u>	<u>b</u>
<u>B</u>	BB	Bb	Bb
<u>b</u>	Bb	bb	

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3. A blue faced Oompa (purebred) is married to an orange faced Oompa. They have 8 children. How many children will have blue faces?

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All will have blue faces (Bb)

	X		
		<u>B</u>	<u>B</u>
<u>b</u>		Bb	Bb
<u>b</u>		Bb	Bb

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4. Otis Oompa has an orange face and is married to Ona Oompa who has a blue face. They have 60 children, 31 of them have orange faces. What are the genotypes of the parents.

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X	<u>B</u>	<u>?</u>
<u>b</u>	Bb	b?
<u>b</u>	Bb	b?

If about half have orange faces, Ona must have the little b allele. So Ona must be Bb

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5. Odie Oompa has a blue face. In fact, everyone in Odie's family has a blue face, and the family boasts that it is a "pure" line. Much to his family's horror, he married Ondi Oompa who "gasp" has an orange face. What are the genotypes of their children. Is Odie's line still "pure"?

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5. Odie Oompa has a blue face. In fact, everyone in Odie's family has a blue face, and the family boasts that it is a "pure" line. Much to his family's horror, he married Ondi Oompa who "gasp" has an orange face. What are the genotypes of their children. Is Odie's line still "pure"?

		<u> b </u>	<u> b </u>
<u> B </u>		Bb	Bb
<u> B </u>		Bb	Bb

All the kids will be Bb. They will have blue faces but all will be hybrids.

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6. Ona Oompa (from #4) divorces Otis and marries Otto. Otto has an orange face. What is the probability that Ona and Otto's children will have orange faces? (Ona is a blue faced hybrid)

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		<u>B</u>	<u>b</u>
<u>b</u>		Bb	bb
<u>b</u>		Bb	bb

50% of their children will have orange faces. Genotype bb

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7. Oompas can have red, blue or purple hair. Purple hair results from the heterozygous condition. Make a "key" showing the genotypes and phenotypes for hair color. Is this an example of codominance or incomplete dominance?

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Answer: **RR is red**

BB is Blue

BR is purple

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8. Orville Oompa has purple hair and is married to Opal Oompa who brags that she has the bluest hair in the valley. How many of Opal's children will be able to brag about their blue hair also?

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X		
	<u>B</u>	<u>B</u>
<u>B</u>	BB	BB
<u>R</u>	BR	BR

50 % of their kids will also have blue hair. The other 50% will have purple hair