

Name _____

Period _____

Punnett Square Worksheet #2

Oompah Loompa Genetics

SHOW ALL WORK and FILL OUT THE PUNNETT SQUARES

1. Oompahs generally have blue faces which is caused by a dominant gene (B). The recessive condition results in an orange face (b). The genotypes and phenotypes possible for Oompa Loompas are as follows: BB=Blue Face, Bb=Blue Face, bb=Orange face. Two hybrid Oompahs are crossed. What fraction of the offspring will have orange faces?

Fraction that have orange faces: _____

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

Children with blue faces: _____

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

Genotype of Otis: _____

Genotype of Ona: _____

5. Odie Oompah 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 Oompah who "gasp" has an orange face. What are the possible genotypes of their children? Is Odie's line still "pure"?

Fractions of Genotypes of children: _____

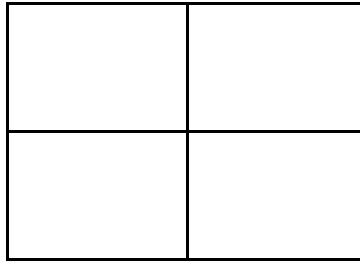
Is Odie's line pure? _____

6. Ona Oompah (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?

Fraction of children that will have orange faces: _____

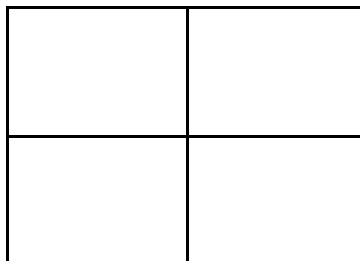
7. Oompahs can have red, blue or purple hair. Purple hair results from the heterozygous condition. The genotypes and phenotypes are as follows: RR=red hair, Rr=purple hair, rr=blue hair. Is this an example of codominance or incomplete dominance?

8. Orville Oompah has purple hair and is married to Opal Oompah 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?



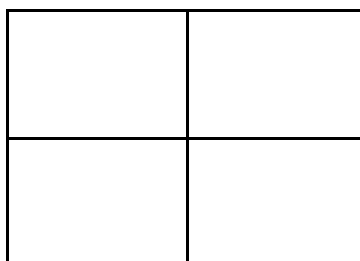
Fraction of children that will have blue hair: _____

9. One of Opal's children is born with shocking red hair. Is Orville the father of this child (show the square to prove your answer)? But wait, Opal swears she has been faithful and claims that the hospital goofed and got her baby mixed with another. Is this a plausible explanation. Show the square to prove your answer.



Is Opal's explanation a good explanation? _____

10. Olga Oompah has red hair and marries Oliver Oompah who has blue hair. They have 32 children. What color is their children's hair?



Fraction of children's hair color: _____

11. Olivia Oompah is married to Odo Oompah and they both have purple hair. What color hair and in what proportion would you expect their children to have?

Fraction of the genotypes of the children: _____

Fraction of the phenotypes of the children: _____

12. In the land of Oompah, blue hair is highly valued, blue haired Oompahs even get special benefits. Oscar Oompah has purple hair but he wants to find a wife that will give him blue haired children. What color hair should his wife have? What would be his second choice?