

OOMPA LOOMPA GENETICS

SHOW WORK HERE!

Monohybrid Crosses

KEY

_____ = gray face

_____ = gray face

_____ = orange face



1. OOmpas generally have gray faces, which is caused by a dominant gene. The recessive condition results in an orange face. Develop a "key" to show the possible genotypes and phenotypes for the OOmpah's face colors.

2. Two heterozygous OOmpahs are crossed. What proportion of the offspring will have orange faces? _____

3. A gray faced OOmpah (homozygous) is married to an orange faced Oompah. They have 8 Oompah children. How many of those children will have gray faces? _____

4. Otis Oompah has an orange face is is married to Ona OOmpah who has a gray face. They have 60 Oompah children, 30 of those children have orange faces. What is Ona and Otis OOmpah's genotype? _____ Show the cross.

5. Odie Oompah has a gray face, in fact everyone in Odie's family has a gray face, and the family likes to brag that they are a "pure" line. Much to his family's horror, he married Ondi Oomah, who ***gasp*** has an orange face. What will be the phenotypes of their children? _____

What are the genotypes of the children? _____

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 an orange face? _____

Incomplete Dominance

7. OOmpahs can have red, blue, or purple hair. The allele that controls this trait is INCOMPLETELY DOMINANT, where purple hair is caused by the heterozygous condition. Show a "key" for the genotypes and phenotypes of hair color.

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

KEY

_____ = blue

_____ = red

_____ = purple

9. One of Opal's children is born with shocking red hair. Is Orville Oompah the father of this child? _____

But wait, Opal swears that she has been faithful, she claims the hospital goofed and got her baby mixed with someone else's. Is Opal the mother of the red haired child?

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

11. Olivia Oompah is married to Odo Oompah. Both of them have purple hair. They have 100 children. What is the hair color of their children and in what proportion?

Red _____ Blue _____ Purple _____

12. In the land of Oompah, blue hair is highly valued. Blue haired Oompahs get special benefits. Oscar Oompah has purple hair but he wants a wife that will give him children with blue hair.

What color hair should he look for in a wife? _____

If he can't find this type of Oompah what should be his second choice? _____

13. Ophelia Oompah is not married but she wants to have children. She goes to a fertility clinic where she is fertilized by an anonymous sperm donor. Ophelia has red hair. 5 months later, a litter of oompahs is born, of the eight babies in the litter, 4 of them have red hair, and 4 of them have purple hair. What color hair did the babies' father have? _____ (Show the cross)

14. Ophelia repeats the process a year later. This time she has a litter of 5 oompahs, all of which have purple hair. What was the father's hair color in this case? _____

(Show the cross)

15. A homozygous gray faced, blue haired oompah named Ortimer marries an orange faced (homozygous) red haired oompah named Odette. $GGBB \times ggRR$ What will Ortimer and Odette's children look like? _____

16. Two oompahs, both heterozygous for both traits are married. Out of 16 children, how many of each type would you expect?