

## GENOTYPES, PROTEIN, & PHENOTYPES

Scientists have identified a gene responsible for the color of feathers of the bird, *Imaginario birbus*. The gene codes for a protein that produces a purple color found in the birds' wings. The gene has two alleles: purple (P) and orange (p).

The purple allele of the gene codes for a normal protein. Since birds can produce enough protein to make their wing feathers purple with only one copy of the purple allele, it is dominant.

The orange allele is a mutation that codes for a protein which cannot make a purple color because it is the wrong shape. A bird with two copies of the orange allele cannot make any purple proteins, so their wing feathers are orange. Since a bird with only one copy of the orange allele can still make purple proteins, the orange allele is recessive.

### Activity 1 Instructions

Using your set of parental chromosomes:

1. Make all possible combinations of alleles their offspring could inherit.
2. Record these possible genotypes in the Punnett square below.
3. Record how many normal purple proteins would be coded for by each genotype.
4. Record what color the bird's phenotype would be for each genotype.

Maternal genotype: \_\_\_\_\_

Paternal Genotype \_\_\_\_\_

# of normal proteins			# of normal proteins
Feather color (phenotype)			Feather color (phenotype)
# of normal proteins			# of normal proteins
Feather color (phenotype)			Feather color (phenotype)

## Activity 2 Instructions

Pair up with a complimentary parent. Using your chromosomes, create all possible combinations your offspring could have. Record the information in the Punnett square below, just like you did on your own. Repeat with a second partner.

Maternal genotype: \_\_\_\_\_

Paternal Genotype \_\_\_\_\_

# of normal proteins			# of normal proteins
Feather color (phenotype)			Feather color (phenotype)
# of normal proteins			# of normal proteins
Feather color (phenotype)			Feather color (phenotype)

Maternal genotype: \_\_\_\_\_

Paternal Genotype \_\_\_\_\_

# of normal proteins			# of normal proteins
Feather color (phenotype)			Feather color (phenotype)
# of normal proteins			# of normal proteins
Feather color (phenotype)			Feather color (phenotype)