Punnett Squares for Two Traits

Dihybrid Cross - A dihybrid cross describes a mating experiment between two organisms that are identically hybrid for two traits. A hybrid organism is one that is heterozygous, which means that is carries two different alleles at a particular genetic position, or locus. Therefore, a dihybrid organism is one that is heterozygous at two different genetic loci.

Phenotype of dominant allele **A** is light colored fur.

Phenotype of recessive allele **a** is dark colored fur.

Phenotype of dominant allele **B** is a long tail.

Phenotype of recessive allele **b** is a short tail.

Female cat is heterozygous on two traits (AaBb)

Male cat is heterozygous on two traits (AaBb)

Model the possible genotypes of their offspring.

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What are the chances of an offspring with light fur and a long tail?

What are the chances of an offspring with light fur and a short tail?

What are the chances of an offspring with dark fur and a long tail?

What are the chance of an offspring with dark fur and a short tail?

Explore organisms that are not hybrids by working with two fictitious traits, looks and style.

**Dominant allele (genotype/phenotype) Recessive allele (genotype/phenotype)**

A – Hollywood looks a – reality TV looks

B – Hollywood style b – reality TV style

The actor is homozygous for Hollywood looks and heterozygous for Hollywood style.

The actress is heterozygous for Hollywood looks and homozygous for reality TV style.

ACTOR

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What are the chances that their offspring is truly Swaggerific, with both Hollywood looks and style?

What are the chances that their offspring has Hollywood looks, but reality TV style?

What are the chances that their offspring has Hollywood style, but reality TV looks?

What are the chances that their offspring is truly Snookirific, with both reality TV looks and style?

The actor is homozygous for both reality TV looks and style.

The actress is heterozygous for both Hollywood looks and style.

ACTOR

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