

Mendel and His Garden Peas

In the 1800's a monk named Gregor Mendel, "crossed" a pure breeding Tall pea plant with a pure breeding short pea plant. The resulting F_1 generation were all Tall.

Mendel concluded Tall was dominant and short was recessive. The F_1 generation were hybrids.

Crossed : breed together

pure breeding: contain only those genes ; same as parent

F_1 : offspring (1st generation)

Dominant : gene that shows

Recessive : masked / hidden by dominant ... only shows if given recessive gene by BOTH parents

Hybrid : mix of 2

Tall & short are called phenotypes. A phenotype is eg) blue eyes, brown eyes, Pink, white flowers,

Pure breeding tall plants are

" short " are

hybrids are

T and t are

T & t are on the chromosome passed on from the parents

Pure breeding : TT and tt are called ...

hybrids : Tt are called ...

MonoHybrid Cross

one-gene

How does Genetics show a "cross"?

Tall x short

punnett
square

F₁ generation : phenotype ?
genotype ?

Next Mendel "crossed" 2 of the F₁ generation
What were the results?

punnett
square

F₂ generation : phenotype ?
genotype ?

2 Important ratios.

3:1 phenotypes

1:2:1 genotype

Practice Genetics Problems

We will solve these together.

1. In cats, long tails are dominant over short tails. A pure-bred (homozygous) long-tailed cat, is crossed with a short tailed cat.
 - a. What are the parent genotypes?

b. What are the genotypes and phenotypes of the F1 (first filial= kids) generation?

c. Draw a punnett square to show the F2 (second filial = grandkids) offspring, when 2 of the F1 generation are bred together.

2. In humans, the allele for brown eyes is dominant over blue. A man with blue eyes has a child, with a woman who is heterozygous for brown eyes. What is the % chance the child will have blue eyes?

3. A man and a woman who are both heterozygous for brown eyes have a child. What is the % chance the child will have brown eyes?

4. A couple who are both blue-eyed have a child. What is the % chance the child will have brown eyes?