It All Adds Up to Us!

Activity

When an organism with dominant traits breeds with an organism with recessive traits, this can result in heterozygous offspring for those traits. Heterozygous offspring show the phenotype of the dominant trait, but their genotype is a combination of the dominant and the recessive alleles. This is represented by a capital and lowercase letter (Tt). In genetics, offspring with either two dominant alleles (TT) or two recessive alleles (tt) are referred to as homozygous for that trait. Some colors in flowers have incomplete dominance, such as pink. This genotype is written Rw for the blend of red and white that makes pink.

Procedure

1.Use the following key with the Punnett Square activity below.

Gene Key: T=Tall t = short R = red w= white Rw = pink

2.Draw a Punnett Square.

3.Cross two tall heterozygous pea plants. Tt X Tt
4.Answer the following questions about your results.

a. How many different phenotypes could occur among the offspring?

b. How many different genotypes could occur among the offspring?

c. What is the decimal of possible offspring that have the same phenotype as the parent?

d. What is the decimal of possible offspring that have the same genotype as the parents?

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Activity, continued

5. Draw another Punnett Square.

6. Cross a homozygous tall pea plant with a short homozygous pea plant. TT X tt
7. Answer the following questions about your results.
   a. There are 18 offspring. How many are tall?

   b. How many of the 18 offspring are hybrid?

   c. How many of the offspring show the recessive trait?

8. Draw another Punnett Square.

9. Cross two pink lilies. Rw X Rw
10. Answer the following questions about your results.
    a. How many different phenotypes could appear in the offspring?

    b. What is the decimal of possible offspring having the same phenotype as the parents?

    c. What is the decimal of possible offspring that are red?