

Name \_\_\_\_\_ Class period \_\_\_\_\_

**SCIENCE B  
NTI DAY 6**

**Genetics**

Mendel's Pea Plants Gregor Mendel experimented with pea plants in a garden. He would take the male part of the flower called the anther which produces pollen and the female part of the flower called the carpel which has an ovary containing ovules. Mendel had several stocks of true-breeding pea plants. The true-breeding (homozygous) pea plants were allowed to self-pollinate and produce offspring identical to the parent pea plants. The true-breeding pea plants let Mendel control his experiment when he cross-pollinated a green seed pea plant with a yellow seed pea plant. He cross pollinated the pea plants by taking pollen from the green seed stock, and fertilized the flowers of the yellow seed stock. He fertilized the flowers by brushing the pollen from the flower of yellow pea plants and wiping the pollen on the carpel of green seed pea plants. This process is known as crosspollination where the seeds came from two different plants. Mendel studied seven different pea plant traits: plant height, the position of the flowers, pea pod shape, pea pod color, seed shape, seed color, and flower color.

1) Why was it important for Mendel to use true-breeding pea plants? (Hint: scientific method)

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2) What is a cross-pollination of pea plants? \_\_\_\_\_

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Mendel crossed the pea plants with contrasting traits, like tall plants and short plants, and studied their offspring. The original pair of plants is called the P (parental) generation. The offspring is called the F1 (first finial) generation. Offspring from parents of different or contrasting traits are called hybrids. When Mendel crossed the two P generation plants, all the F1 generations had characteristics from the P generation. Of all the F1 generation plants, only one of the characteristics was expressed and the other characteristic seemed to be lost. Mendel learned two things from these crosses: inheritance of traits (genes) is passed from one generation to the next and the principle of dominance. Alleles are usually the genetic code for a gene found in a certain location on a chromosome.

3) Explain how Mendel used the F1 generation to conclude that genes are inherited.

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4) Why was only one of the parent's characteristics for a trait expressed, while the other seemed to be lost? \_\_\_\_\_

Scientists today study heredity by using Punnett squares. Alleles may be represented as two letters because the plant or animal has two sets of genes, one from their father and one from their mother. When the two letters are the same, either both capital T T or both lower case t t , they are called homozygous. When the two letters are opposite, they are called heterozygous. Since Mendel use true-bred pea plants, the purple flowers alleles are T T. The white flower alleles are t t.

Fill in the Punnett square below of the trait flower color for two true-breeding pea plants. Purple = dominant White = recessive


5) After looking at the punnett square and using the vocabulary terms above, why were all the offspring in the F1 generation showing the dominant characteristic?

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