

## Worksheet

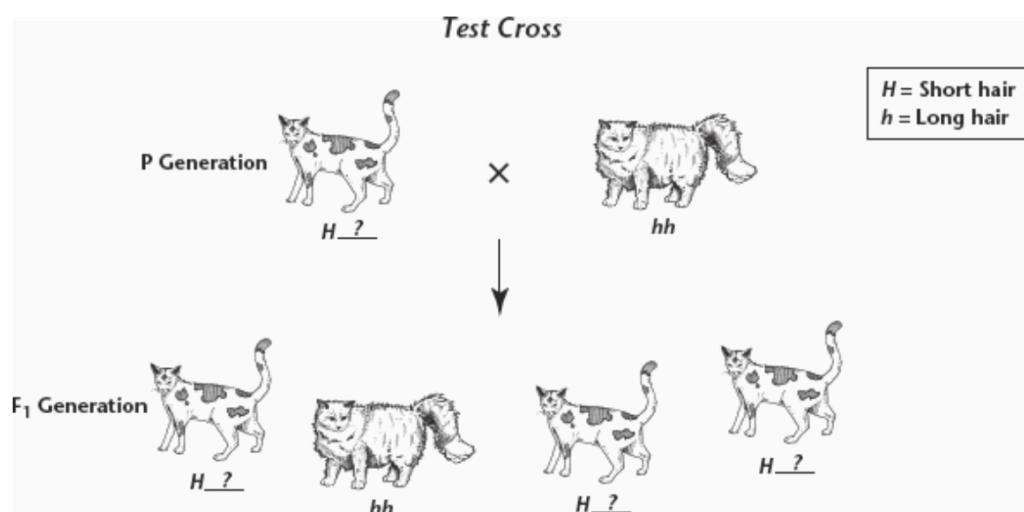
8th Grade

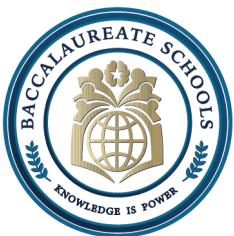
Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Read the passage and study the diagram below. Then use a separate sheet of paper to answer the questions that follow.**

Can you curl up the sides of your tongue into a tube shape? Does your skin have freckles? Do dimples appear on your cheeks when you smile? Chances are you have one of these traits, because they are controlled by dominant alleles. When an organism has a trait controlled by a dominant allele, it can be either a hybrid or a purebred. To find out which geneticists, or scientists who study patterns of inheritance, use a test cross. In a test cross, the organism with the trait controlled by a dominant allele is crossed with an organism with a trait controlled by a recessive allele. If all offspring have the trait controlled by the dominant allele, then the parent is probably a purebred. If any offspring has the recessive trait, then the dominant parent is a hybrid. One tool geneticists use to determine which traits are being inherited is called a Punnett square. This model allows them to see how many offspring will potentially have a certain trait. A Punnett square works on probability. In the field of genetics, there is no guarantee that a specific gene will make it from parent to offspring. Study the test cross diagram below. In a test cross, a researcher crosses an organism with the homozygous recessive trait with an organism that has the dominant trait, but an unknown genotype.



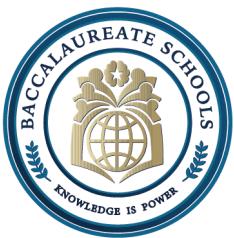


### Analyze and Interpret Data

1. Identify Is the long-haired cat in the P generation a hybrid or a purebred? Explain your Answer.

2. Predict Based on the F 1 generation, would you expect that the short-haired cat in the P generation is a hybrid or a purebred? Explain your thinking.

3. Construct a Model On a sheet of graph paper, construct two Punnett squares that show Name Class Date the possible crosses in the P generation.



4. Describe Patterns Did your Punnett square support your prediction? Explain your answer.  
(Reminder: Punnett squares show the probability of a cross.)

5. Construct a Model Create drawings to illustrate the results of your two Punnett squares that are similar in style to the drawings on this worksheet.