Rabbit Trait Odds

Use a Punnett square to predict offspring trait probabilities.

LS.10.c "Punnett squares are mathematical models used to predict the probability of traits in offspring."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline the sentences that explain how to fill the Punnett square, and circle each probability prediction so you can connect the model to its result.

Curly Fur Predictions

1. A pair of rabbits can help scientists use a Punnett square. In this example, the allele C produces curly fur and is dominant. The allele c produces straight fur only when a rabbit has two c alleles. Both parent rabbits have genotype Cc, so each has one curly-fur allele and one straight-fur allele.

2. Before making the square, list the possible alleles in each parent's gametes. A Cc rabbit can pass on C or c, with each allele having an equal chance. Place one parent's choices across the top and the other parent's choices along the side. Each inside cell combines one allele from each parent. The figure shows all possible combinations.

PUNNETT SQUARE FOR CC × CC RABBITS

Parent 2 allele	C	c
C	CC	Cc
c	Cc	cc

3. The square has four equally likely cells. One cell shows CC, two show Cc, and one shows cc. Because C is dominant, CC and Cc rabbits would have curly fur. The model predicts a 3 out of 4, or 75 percent, chance of curly fur and a 1 out of 4, or 25 percent, chance of straight fur. Litters may differ because chance affects each fertilization.

2 ANSWER WITH EVIDENCE

Use the passage

1. What two alleles can a parent with genotype Cc pass on in its gametes?

2. Which offspring genotype appears in two cells of the Punnett square?

3. What is the predicted probability that an offspring will have curly fur?

4. Why might a litter of four rabbits not have exactly three rabbits with curly fur?

3 YOUR TURN

Your own words

In pea plants, P is the dominant allele for purple flowers and p is the allele for white flowers. A Pp plant crosses with a pp plant. Complete the table with all four gamete pairings, offspring genotypes, and predicted flower colors. Then state the predicted chance of each flower color on the lines below.

PARENT 1 GAMETE	PARENT 2 GAMETE	OFFSPRING GENOTYPE	PREDICTED FLOWER COLOR

ANSWER KEY # Rabbit Trait Odds

PART 1 · READ AND MARK

Underline the sentences that explain how to fill the Punnett square, and circle each probability prediction so you can connect the model to its result. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	What two alleles can a parent with genotype Cc pass on in its gametes?	**C or c.**
2	Which offspring genotype appears in two cells of the Punnett square?	**Cc.**
3	What is the predicted probability that an offspring will have curly fur?	**3 out of 4, or 75 percent.**
4	Why might a litter of four rabbits not have exactly three rabbits with curly fur?	**Each fertilization is a chance event, so an actual litter may differ from the predicted ratio.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

P | p | Pp | purple P | p | Pp | purple p | p | pp | white p | p | pp | white Prediction: Purple flowers have a 2 out of 4, or 50 percent, chance. White flowers have a 2 out of 4, or 50 percent, chance.

Accept equivalent probability forms, including fractions, percentages, or ratios. For the open task, accept the four pairings in any order, as long as two are Pp and purple and two are pp and white.