

GENETICS PRACTICE EXERCISES

Problem 1

Direction: Read and analyze each word problem carefully. Solve what is being asked in the problem. Place your answers in the space provided. Show your solutions through the Punnett square provided. Use the letters assigned to each trait.

Problem 1: In hamsters, brown fur color is dominant over albino. Alex has one brown male hamster and one brown female hamster. He allowed his brown hamsters to mate and was shocked to see that three of the hamster babies were brown and one was an albino!

- a. What are the **genotypes** of the parents? Use the **letter B** for the genotypes.

Show how this happened with a **Punnett square** (the shaded area is for the parents' genotype). If there is a heterozygous parent, always place their genotype in the **top row**.

- b. What is the **genotypic ratio**?



Problem 2: In cats, the allele for short hair is dominant over the allele for long hair. A hybrid short-haired male is mated to a long-haired female.

- a. What will be the **genotypes** of the offspring? Use **letter H** for the genotypes.

Show how this happened with a **Punnett square**. If there is a heterozygous parent, always place their genotype in the **top row**.

- b. What is the **genotypic ratio**?

- c. What is the **phenotypic ratio**?



Problem 3: In humans, albinism is recessive over normal skin pigmentation. A male albino man marries a woman who is normal-skinned, but has a mother who is an albino.

- a. What is the genotype of the female? Use **letter A** for the genotypes.

- b. What are the possible **genotypes** of their offspring?

Show how this happened with a **Punnett square**. If there is a heterozygous parent, always place their genotype in the **top row**.

- c. What are the **chances** that their offspring will have albino children?



Problem 4: In humans, widow's peak is dominant over straight hairline. Mrs. And Mr. Smith both have widow's peaks. Their first child also has a widow's peak, but their second child has straight hairline. Mr. Smith accuses Mrs. Smith of being unfaithful to him.

- a. Is he correct in accusing his wife?

- b. Justify your answer by making a Punnett square showing a scenario in which having a child with straight hair is possible. Use the **letter W**. If there is a heterozygous parent, always place their genotype in the **top row**.

- c. What is the **possibility** that the offspring of Mr. and Mrs. Smith will have straight hairline?

