Genetics Practice:

**A: In hamsters the gene for hair length has two alleles:**

**L - long hair**

**l - short hair**

1. What is the phenotype of a hamster with the genotype LL? Long hair

2. What is the phenotype of a hamster with the genotype Ll? Long hair

3. Draw a Punnett square showing the possible offspring of an LL male mating with an Ll female.

|  |  |  |
| --- | --- | --- |
|  | L | L |
| L | **LL**  **Long Hair** | **LL**  **Long Hair** |
| l | **Ll**  **Long Hair** | **Ll**  **Long Hair** |

4. Write the phenotype of each offspring. in Table

5. What is the probability of an offspring with each of the following genotypes:

LL 50%

Ll 50%

ll 0%

6. What is the probability of an offspring with each of the following phenotypes:

Long hair 100%

Short hair 0%

7. How would the results change if it were an LL female and an Ll male? Not at all.

**B: In hamsters the gene for hair length has two alleles:**

**L - long hair**

**l - short hair**

1. What is the phenotype of a hamster with the genotype ll? short hair

2. What is the phenotype of a hamster with the genotype Ll? long hair

3. Draw a Punnett square showing the possible offspring of an ll female mating with an Ll male.

|  |  |  |
| --- | --- | --- |
|  | l | l |
| L | **Ll**  **Long Hair** | **Ll**  **Long Hair** |
| l | **ll**  **Short Hair** | **ll**  **Short Hair** |

4. Write the phenotype of each offspring. In table

5. What is the probability of an offspring with each of the following genotypes:

LL 0%

Ll 50%

ll 50%

6. What is the probability of an offspring with each of the following phenotypes:

Long hair 50%

Short hair 50%

7. How would the results change if it were an ll male and an Ll female? Not at all.

**C: In dogs rough hair allele (R) is dominant over the smooth hair allele (r).**

1. Draw a Punnett square showing the cross of an Rr male and an Rr female.

|  |  |  |
| --- | --- | --- |
|  | R | r |
| R | **RR**  **Rough Hair** | **Rr**  **Rough Hair** |
| r | **Rr**  **Rough Hair** | **rr**  **smoothHair** |

2. What is the probability of each of the following genotypes in the offspring?

RR 25%

Rr 50%

rr 25%

3. What is the probability of each of the following phenotypes in the offspring?

Rough hair 75%

Smooth hair 25%

**D: In rabbits the floppy ear allele (F) is dominant over the erect ear allele (f).**

1. Draw a Punnett square showing the cross of an erect ear female with a heterozygous floppy eared male.

|  |  |  |
| --- | --- | --- |
|  | f | f |
| F | **Ff**  **floppy** | **Ff**  **floppy** |
| f | **ff**  **erect** | **ff**  **erect** |

2. What is the probability of each of the following genotypes in the offspring?

FF 0%

Ff 50%

ff 50%

3. What is the probability of each of the following phenotypes in the offspring?

Erect ears 50%

Floppy ears 50%

**E: In tulips the allele for red flowers is dominant over the allele for white flowers.**

1. Draw a Punnett square showing two red flowered plants producing a white flowered offspring.

|  |  |  |
| --- | --- | --- |
|  | R | r |
| R | **RR** | **Rr** |
| r | **Rr** | **rr**  **White** |

**F: In tulips the allele for red flowers is dominant over the allele for white flowers.**

1. Draw a Punnett square for a cross that results in a 50% chance of red flowered offspring and a 50% of white flowered offspring.

|  |  |  |
| --- | --- | --- |
|  | R | r |
| r | **Rr** | **rr** |
| r | **Rr** | **rr** |

**G: In zucchini plants when pure breeding red flowered plants are crossed with pure breeding yellow flowered plants 100% of the offspring (F1 generation) have orange flowers.**

1. Draw a Punnett square showing this cross.

|  |  |  |
| --- | --- | --- |
|  | R | R |
| Y | **RY** | **RY**  **Long Hair** |
| Y | **RY**  **Long Hair** | **RY**  **Long Hair** |

2. Draw a Punnett square showing the cross of two F1 generation plants.

3. What is the genotype and phenotype ratio of the F2 generation?