Name: Answer Key Date: 4/23/14 Block:\_\_\_\_\_\_\_\_

**Genetics Practice Problems** from <http://www.biologycorner.com/worksheets/genetics_practice.html>

1. For each genotype, indicate whether it is heterozygous (HE) or homozygous (HO)

|  |  |  |  |
| --- | --- | --- | --- |
|  AA HO Bb HE Cc HE Dd HE | Ee HE ff HOGG HOHH HO | Ii HEJj HEkk HOLl HE | Mm HEnn HOOO HOPp HE |

2. For each of the genotypes below, determine the phenotype.

|  |  |
| --- | --- |
| *Purple flowers are dominant to white flowers*PP purplePp purplepp white | *Brown eyes are dominant to blue eyes*BB brownBb brown bb blue |
| *Round seeds are dominant to wrinkled*RRroundRr roundrrwrinkled | *Bobtails are recessive (long tails dominant)*TT long tailTt long tailtt bobtail |

3. For each phenotype, list the genotypes. (Remember to use the letter of the dominant trait)

|  |  |
| --- | --- |
| *Straight hair is dominant to curly.*SS straightSs straight ss curly | *Pointed heads are dominant to round heads.*PP pointedPp pointed pp round |

4. Set up the square for each of the crosses listed below. The trait being studied is round seeds (dominant) and wrinkled seeds (recessive)

**Rr x rr**

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

What percentage of the offspring will be round? 50%

## Rr x R r

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

What percentage of the offspring will be round? 75%

## RR x Rr

|  |  |  |
| --- | --- | --- |
|  | **R** | **R** |
| **R** | **RR** | **RR** |
| **r** | **Rr** | **Rr** |

What percentage of the offspring will be round? 100%

**Practice with Crosses. Show all work!**

5. A TT (tall)plant is crossed with a tt(short plant). What percentage of the offspring will be tall?

 100%

|  |  |  |
| --- | --- | --- |
|  | **T** | **T** |
| **t** | **Tt** | **Tt** |
| **t** | **Tt** | **Tt** |

6. A Tt plant is crossed with a Tt plant. What percentage of the offspring will be short? 25%

|  |  |  |
| --- | --- | --- |
|  | **T** | **t** |
| **T** | **TT** | **Tt** |
| **t** | **Tt** | **tt** |

7. A heterozygous round seeded plant (Rr) is crossed with a homozygous round seeded plant (RR). What percentage of the offspring will be homozygous (RR)? 50%

|  |  |  |
| --- | --- | --- |
|  | **R** | **r** |
| **R** | **RR** | **Rr** |
| **R** | **RR** | **Rr** |

8. A homozygous round seeded plant is crossed with a homozygous wrinkled seeded plant. What are the genotypes of the parents? RR x rr

What percentage of the offspring will also be homozygous? 0%

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

9. In pea plants purple flowers are dominant to white flowers. If two white flowered plants are cross, what percentage of their offspring will be white flowered? 100%

|  |  |  |
| --- | --- | --- |
|  | **p** | **p** |
| **p** | **pp** | **pp** |
| **p** | **pp** | **pp** |

10. A white flowered plant is crossed with a plant that is heterozygous for the trait. What percentage of the offspring will have purple flowers? 50%

|  |  |  |
| --- | --- | --- |
|  | **p** | **p** |
| **P** | **Pp** | **Pp** |
| **p** | **pp** | **pp** |

11. Two plants, both heterozygous for the gene that controls flower color are crossed. What percentage of their offspring will have purple flowers? 75% What percentage will have white flowers? 25%

|  |  |  |
| --- | --- | --- |
|  | **P** | **p** |
| **P** | **PP** | **Pp** |
| **p** | **Pp** | **pp** |

12. In guinea pigs, the allele for short hair is dominant.

What genotype would a heterozygous short haired guinea pig have? Ss

What genotype would a pure breeding (homozygous) short haired guinea pig have? SS

What genotype would a long haired guinea pig have? ss

13. Show the cross for a pure breeding short haired guinea pig and a long haired guinea pig.

What percentage of the offspring will have short hair? 100%

|  |  |  |
| --- | --- | --- |
|  | **S** | **S** |
| **s** | **Ss** | **Ss** |
| **s** | **Ss** | **Ss** |

14. Show the cross for two heterozygous guinea pigs. What percentage of the offspring will have short hair? 75% What percentage of the offspring will have long hair? 25%

|  |  |  |
| --- | --- | --- |
|  | **S** | **s** |
| **S** | **SS** | **Ss** |
| **s** | **Ss** | **ss** |

15. Two short haired guinea pigs are mated several times. Out of 100 offspring, 25 of them have long hair. What are the probable genotypes of the parents? Ss x Ss Show the cross to prove it!

|  |  |  |
| --- | --- | --- |
|  | **S** | **s** |
| **S** | **SS** | **Ss** |
| **s** | **Ss** | **ss** |