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

I CAN explain how inherited traits are passed from generation to generation and how they are different than learned traits.

 Period \_\_\_Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Simple Genetics Practice Problems**

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

|  |  |  |
| --- | --- | --- |
| AA \_\_\_\_\_DD \_\_\_\_ | Ee \_\_\_\_HH \_\_\_\_ | Ii \_\_\_\_oo \_\_\_\_ |

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

|  |  |
| --- | --- |
| *Purple flowers are dominant to white flowers*PP \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Pp \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_pp \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | *Brown eyes are dominant to blue eyes*BB \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Bb \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_bb \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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

|  |  |
| --- | --- |
| *Straight hair is dominant to curly.*\_\_\_\_\_\_\_\_\_\_\_\_ straight\_\_\_\_\_\_\_\_\_\_\_\_ straight\_\_\_\_\_\_\_\_\_\_\_\_ curly | *Pointed heads are dominant to round heads.*\_\_\_\_\_\_\_\_\_\_\_\_ pointed\_\_\_\_\_\_\_\_\_\_\_\_ pointed\_\_\_\_\_\_\_\_\_\_\_\_ 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 |

|  |  |
| --- | --- |
|  |  |
|  |  |

 | What percentage of the offspring will be round? \_\_\_\_\_\_\_\_\_\_\_ |
| Rr x Rr |

|  |  |
| --- | --- |
|  |  |
|  |  |

 | What percentage of the offspring will be round? \_\_\_\_\_\_\_\_\_\_\_ |

 RR x Rr

|  |  |
| --- | --- |
|  |  |
|  |  |

 What percentage of the offspring will be round?

\_\_\_\_\_\_\_\_\_\_\_

PRACTICE WITH CROSSES. SHOW ALL YOUR WORK!

|  |  |
| --- | --- |
|  |  |
|  |  |

5. A TT (tall) plant is crossed with a tt (short plant.).

 What percentage of the offspring will be tall? \_\_\_\_\_\_\_\_\_

|  |  |
| --- | --- |
|  |  |
|  |  |

6. A Tt plant is crossed with a Tt plant. What percentage

 of the offspring will be short? \_\_\_\_\_\_\_\_\_\_

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| --- | --- |
|  |  |
|  |  |

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)? \_\_\_\_\_\_\_\_\_

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| --- | --- |
|  |  |
|  |  |

8. A homozygous round seeded plant is crossed with a homozygous

 wrinkled seeded plant. What are the genotypes of the parents?

 \_\_\_\_\_\_\_\_\_\_\_\_\_ X \_\_\_\_\_\_\_\_\_\_\_\_\_\_

9. What percentage of the offspring will also be homozygous? \_\_\_\_\_\_

|  |  |
| --- | --- |
|  |  |
|  |  |

10. In pea plants, purple flowers are dominant to white flowers.

 If two white flowered plants are crossed, what percentage of

 their offspring will be white flowers? \_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |
| --- | --- |
|  |  |
|  |  |

11. A white flowered plant is crossed with a plant that is

 heterozygous for the trait. What percentage of the

 offspring will have purple flowers? \_\_\_\_\_\_\_\_\_\_\_\_\_

 (purple is dominant)

12. Two plants, both heterozygous for the gene that controls

|  |  |
| --- | --- |
|  |  |
|  |  |

 flower color are crossed. What percentage of their offspring

 will have purple flowers? \_\_\_\_\_\_

 What percentage will have white flowers? \_\_\_\_\_\_\_

 **In questions #13-16: In guinea pigs, the allele for short hair is dominant.**

13. What **genotype** would a heterozygous short haired guinea pig have? \_\_\_\_\_\_\_\_\_\_\_\_

 What **genotype** would a purebreeding short haired guinea pig have? \_\_\_\_\_\_\_\_\_\_\_\_

 What **genotype** would a long haired guinea pig have? \_\_\_\_\_\_\_\_\_\_\_\_

|  |  |
| --- | --- |
|  |  |
|  |  |

14. 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? \_\_\_\_\_\_\_\_\_\_

|  |  |
| --- | --- |
|  |  |
|  |  |

15. Show the cross for two heterozygous guinea pigs.

 What percentage of the offspring will have short hair? \_\_\_\_\_\_\_

 What percentage of the offspring will have long hair? \_\_\_\_\_\_\_\_

16. 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? \_\_\_\_\_\_\_\_\_ X \_\_\_\_\_\_\_\_\_\_\_\_

Show the cross to prove it!

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| --- | --- |
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