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

Basic Genetics Practice

**Questions 1-5: Identify the following Genotypes as either *H.D.* (Homozygous Dominant), *Het.* (Heterozygous), or *H.R.* (Homozygous Recessive):**

1. RR \_\_\_\_\_\_\_ 2. tt \_\_\_\_\_\_\_ 3. Dd \_\_\_\_\_\_\_ 4. Tt \_\_\_\_\_\_\_ 5. rr \_\_\_\_\_\_\_

**Questions 6-8: Identify the phenotype for each of the following genotypes:**

6. No freckles (F) is Dominant to having freckles (f).

FF \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Ff \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ff \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. No cleft chin (N) is Dominant to having a cleft chin (n).

NN \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Nn \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ nn \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8. Straight thumb (T) is Dominant to having a “hitchhiker’s” thumb (t).

TT \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Tt \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ tt \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Questions 9-10: Write the possible genotypes for each phenotype:**

9. Tongue-rolling (T) is dominant to not being able to roll your tongue (t).

Tongue Rolling: \_\_\_\_\_\_\_\_\_\_\_\_ Unable to roll tongue: \_\_\_\_\_\_\_\_\_\_\_\_

10. Right-handedness (R) is dominant to left-handedness (r).

Right handed: \_\_\_\_\_\_\_\_\_\_\_\_ Left handed: \_\_\_\_\_\_\_\_\_\_\_\_

11. John, who is homozygous for the ability to roll his tongue, marries Jane who is heterozygous for tongue-rolling. Complete a Punnett square determining the percent probability of their children also being able to roll their tongues like them.

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|  |  |

Genotype: Phenotype:

\_\_\_\_\_ % Homozygous Dominant \_\_\_\_\_ % \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_ % Heterozygous \_\_\_\_\_ % \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_ % Homozygous Recessive

12. Toby and Tiffany are both heterozygous and do not have cleft chins. What are the probabilities of the types of chins of their children?

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

Genotype: Phenotype:

\_\_\_\_\_ % Homozygous Dominant \_\_\_\_\_ % \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_ % Heterozygous \_\_\_\_\_ % \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_ % Homozygous Recessive

13. Kevin and Sarah are both heterozygous for having straight thumbs, which is dominant to having a “hitchhiker’s” thumb. Their son Kyle has a curved “hitchhiker’s” thumb, is this possible? What are the odds?

Genotype: Phenotype:

\_\_\_\_\_ % Homozygous Dominant \_\_\_\_\_ % \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_ % Heterozygous \_\_\_\_\_ % \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_ % Homozygous Recessive

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| --- | --- |
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14. How is it possible for two right-handed (dominant) people to have a child who is left-handed?

[What do the genotypes of both parents have to be?]

15. Sanford does not have freckles (dominant) while his wife Sally does have freckles. Their son Lamont has freckles like his mom. What is Sanford’s (the dad) genotype?

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

16. Which processes allow for parents to pass down their genetic information to their offspring?

17. When the mother and father’s genotypes are put above and beside the Punnett square, what do these letters represent? (what kind of cells are represented?)