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

**Block: \_\_\_\_\_\_\_\_**

**Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Genetics Practice Test**

(**March 25, 2014**)

1. **How many pairs** of chromosomes do humans have in every one of their somatic

cells? \_\_\_\_\_\_\_\_\_.

1. **How many total chromosomes** do humans have in every one of their somatic

cells? \_\_\_\_\_\_\_\_\_.

1. How many chromosomes do humans have in each of their gametes? \_\_\_\_\_\_
2. How many chromosomes do kids have in their somatic cells, if they are born with Down

Syndrome? \_\_\_\_\_\_\_\_\_\_

1. What is the “**n**” number of a sex cell at the end of meiosis? \_\_\_\_\_\_\_ (**1n or 2n**).
2. Which of the following cells in our body are diploid: Sperm; egg: muscle cell?

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

1. What does the prefix “**pheno**” mean? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. What does the prefix “**geno**” mean? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. What is a **phenotype**? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. What is a **genotype**? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. During which phase of meiosis does crossing-over occur? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. What does crossing-over accomplish? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
7. What is the difference in the purpose of meiosis vs. the purpose of mitosis?

**The purpose of meiosis is** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**,**

**while the purpose of mitosis is** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.**

1. What is the difference in the number of chromosomes in the end-products of meiosis vs. the end-products of mitosis?

**At the end of meiosis the gametes will have** \_\_\_\_\_ **chromosomes**. **At the end**

**of** **mitosis, the daughter cells will have \_\_\_\_\_\_ chromosomes.**

1. What is the difference between meiosis and mitosis in terms of the location where each cell division occurs?

**The location of meiosis is in** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **while the location of mitosis**

**is** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

1. In terms of the end-product of meiosis and mitosis, how many gametes are made vs. how many daughter cells are produced?

**\_\_\_\_\_\_\_\_ gametes are formed in meiosis.**

\_\_\_\_\_\_\_\_ **daughter cells are created in mitosis.**

1. Next to each allele pair, indicate whether the pair is heterozygous or homozygous.

**Nn**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **RR**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**tt**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **Hh**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

18. The father, not the mother determines the sex of a child. Explain.

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

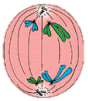
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

19. Various forms of a gene are called: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

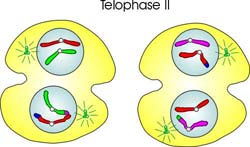
20. Put these slides of meiosis in the proper order by listing the letters on the 8 blanks

provided below, in the proper sequence:

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







**B**

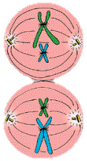
**C**

**A**









**ED**

**F**

**D**

**E**



**G**

**H**

21. Why are males more likely to display recessive sex-linked traits?

22. In guinea pigs, the gene for black coat color is dominant to the gene for white coat color. If two heterozygous black guinea pigs are mated, what will be the phenotypes and genotypes of the first generation? (use **B**=Black, **b**=White)

What is the genotype ratio? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What is the phenotype ratio?

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

23. How many different gamete combinations are produced from the following parental genotype: **AABBCCDdEEFf**

24. If a certain disease affects mostly males, what can you assume about the gene?

25. Some dogs of one breed bark while others are silent. The barking trait is due to a dominant

gene (**B**=bark, **b**=no bark). Also in dogs, Erect ears (**E**) are dominant to drooping ears (**e**). What is the genotype and phenotype ratio of the pups that would come from a heterozygous barker, heterozygous erect-eared mated to a silent, droopy-eared individual?

**Parent’s Genotypes**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ X \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Genotype ratio**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Phenotype ratio**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

26. Hemophilia is a X-linked (sex-linked) recessive trait. What are the results of crossing a

hemophiliac female and a normal male? (**H** = Normal; **h** = hemophilia)

What percent of the boys will have hemophilia?

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

What percent of the girl’s will have hemophilia?

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

27. If a tall plant crosses with a short plant and one of their offspring is short, what

would the genotypes of the parents have to be? (**T**=tall, **t**=short)

Parent’s Genotypes: \_\_\_\_\_\_\_\_\_ **X** \_\_\_\_\_\_\_\_\_\_\_\_\_

28. What is the genotype(s) for Type **A** blood: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

29. What is the genotype(s) for Type **B** blood: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

30. What is the genotype(s) for Type **AB** blood: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

31. What is the genotype(s) for Type **O** blood: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

32. A man has Type A blood and his wife has Type B blood. A physician types the blood of their 4

children and is amazed to find one of each of the 4 blood types. How is this possible? Explain using a Punnett Square.

33. Explain Mendel’s Law of Segregation and Law of Independent assortment.

34. If a male and female black bear have offspring, what is the probability of having a male cub? Show how you can explain this using a Punnett Square.

Probability = \_\_\_\_\_\_\_\_**%**

35. **Pedigree Chart Practice**

1. What do the circles represent? \_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. What do the squares represent? \_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. What do the filled-in shapes represent? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. What does a horizontal line represent? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. How many offspring are in the F1 generation? \_\_\_\_\_\_\_\_\_

**1.**

**4.**

**3.**

**2.**

**5.**

A straight thumb is a dominant gene (**T**). If you clench your fist and put your thumb up (as if hitchhiking) and your thumb has a significant backward bend, you have “Hitchhiker’s Thumb”

(**t**), a recessive trait which will show when a person is homozygous recessive. List the genotypes for the 5 numbered individuals above. Write answers on blanks below.

1. \_\_\_\_\_\_\_\_ **2**. \_\_\_\_\_\_\_\_\_ **3**. \_\_\_\_\_\_\_\_\_ **4**. \_\_\_\_\_\_\_\_\_ **5**. \_\_\_\_\_\_\_\_\_