**It Must Be Genetic – Review**

Nitrogen bases in DNA: \_\_\_Adenine\_\_\_ & \_\_\_\_\_Thymine\_\_ pair up.

\_\_\_\_Cytosine\_\_\_\_ & \_\_\_\_\_\_Guanine\_\_\_ pair up.

1. A \_\_dominant\_\_ allele is the form of a trait that will always show up assuming that the gene is working correctly.
2. An organism that has both a dominant and a recessive gene is called a \_\_hybrid\_\_\_\_.
3. For each genotype below, indicate whether it is a heterozygous (He) OR homozygous (Ho).

TT \_Ho\_ Bb \_He\_\_ DD \_Ho\_\_ Ff \_He\_\_ tt \_Ho\_\_ dd \_\_Ho\_

Dd \_He\_\_ ff \_\_Ho\_ Tt \_\_He\_ bb \_\_Ho\_ BB \_Ho\_\_ FF \_Ho\_\_\_\_

Which of the genotypes in #3 would be considered purebred?

TT, DD, tt, dd, ff, bb, BB, FF

Which of the genotypes in #3 would be hybrids? Bb, Ff, Dd, Tt

1. Determine the phenotype for each genotype using the information provided about SpongeBob.

Yellow body color is dominant to blue.

YY \_\_yellow body\_\_\_\_ Yy \_\_\_yellow body\_\_\_ yy \_\_\_blue body\_\_\_\_\_\_\_

Square shape is dominant to round.

SS \_\_\_square shape\_\_\_ Ss \_\_\_\_square shape\_\_\_\_\_\_\_\_\_\_\_\_ ss \_\_\_\_round shape\_\_\_\_

1. For each phenotype, give the genotypes that are possible for Patrick.

A tall head (T) is dominant to short (t).

Tall = \_\_TT, Tt\_\_\_\_\_\_\_\_\_\_ Short = \_\_\_\_tt\_\_\_\_\_\_\_\_\_

Pink body color (P) is dominant to yellow (p).

Pink body = \_\_PP, Pp\_\_\_\_\_\_\_\_\_ Yellow body = \_\_\_\_\_\_pp\_\_\_\_\_\_\_\_

1. SpongeBob SquarePants recently met SpongeSusie Roundpants at a dance. SpongeBob is heterozygous for his square shape, but SpongeSusie is round. Create a Punnett square to show the possibilities that would result if SpongeBob and SpongeSusie had children. HINT: Read question #4!

**S s**

|  |  |
| --- | --- |
| **Ss** | **ss** |
| **Ss** | **ss** |

**s**

**s**

1. List the possible genotypes and phenotypes for their children. Ss – square, ss - round
2. What are the chances of a child with a square shape? \_2\_ out of \_\_4\_\_ or \_50%
3. What are the chances of a child with a round shape? \_\_2\_\_ out of \_\_4\_\_ or \_\_50\_\_%

**Pedigrees:**

1. A marriage is indicated by a horizontal line

connecting a circle to a square.

a. How many marriages are there? \_\_\_three\_\_\_\_\_

1. A line perpendicular to a marriage line indicates the offspring. If the line ends with either a circle or a square, the couple had only one child. However, if the line is connected to another horizontal line, then several children were produced, each indicated by a short vertical line connected to the horizontal line. The first child born appears to the left and the last born to the right.

*a. How many children did the first couple (couple in row I) have? \_\_2\_\_\_\_*

*b. How many children did the third couple (couple in row III) have? \_\_\_7\_\_\_\_\_\_*

Level I represent the first generation; Level II represents the second generation and so on.

*a. How many generations are there? \_\_\_4\_\_\_\_\_\_*

*b. How many members are there in the fourth generation? \_\_\_\_7\_\_\_\_\_*

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1. Humans reproduce by what reproduction method?
   1. Asexual reproduction
   2. Binary fission
   3. Budding
   4. Sexual reproduction
2. If a tall plant (TT) is crossed with a short plant (tt), all of the offspring will be:
   1. Tall
   2. Short
   3. Medium
   4. Combination
3. When two identical alleles for a trait are in an organism, the organism is said to be \_\_\_\_\_\_\_\_\_\_\_\_?
   1. Heterozygous and purebred
   2. Homozygous and purebred
   3. Heterozygous and hybrid
   4. Homozygous and hybrid
4. What are Punnett Squares used for?
   1. identifying the gene locus where allelic variations are possible
   2. determining the DNA sequence of a given gene
   3. testing for the presence of the recessive allele
   4. predicting the result of genetic crosses between organisms of known genotypes
5. What probability and gender is associated with a ½ shaded circle on a pedigree?
   1. 50% male
   2. 50% female
   3. 100% male
   4. 100% female

6. Which of the following distinguish sex-linked disorders?

1. Males are only "carriers" of sex-linked disorders.
2. Sex-linked disorders only affect the reproductive organs of the offspring.
3. Sex-linked disorders are passed on from mothers to daughters.
4. Males more often have sex-linked disorders than females.

7. Julie's house is built over an ancient landfill that contains many radioactive chemicals

many of which are known genetic mutagens. Which of the following is a probable genetic result of living over this landfill?

1. Julie's house has a funny smell to it.
2. Significantly more people on Julie's street have cancer than in other places in the same city.
3. More twins are born on Julie's street than on streets on either side of her.
4. More people have dogs in Julie's neighborhood than cats.