

Directions: Answer all the questions below.

- Who was Gregor Mendel? Father of genetics
- What is genetics? study of inheritance
- What percent does each parent contribute to the offspring? 50%
- What is used to complete the crosses? (HINT: the boxes) Punnett Squares
- The gametes from the parent go where on the punnett square?  
Top and Side or Inside each box
- Give the term for Bb Heterozygous
- Define Phenotype What it looks like
- Dominant allele hides a Recessive allele.
- How many traits are studied in a monohybrid cross?  
One

10. Do the cross of Aa x Aa

A = axial flowers a = terminal flowers

Genotypic ratio: 1:1

Phenotypic ratio: 1:1

11. Define Incomplete Dominance

Blending of the heterozygote

12. Do a cross between a Red (RR) and a White (R'R')


Genotypic ratio: 1

Phenotypic ratio: 1

13. Define Co-dominance

Equal expression in heterozygote

14. Define multiple allele

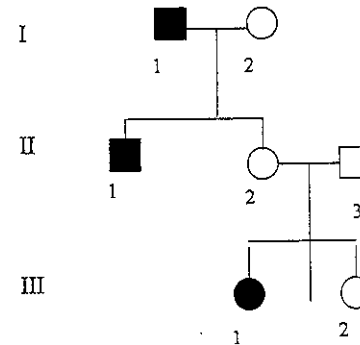
Many forms of a gene

15. Do a cross between O (ii) and AB ( $I^A I^B$ )


Probability of a child with A blood? 50%

16. What is a pedigree? studies patterns of inheritance

17. Use the pedigree to answer a) - c)



- Is this trait dominant or recessive? recessive
- Who has the trait? I-1, II-1, III-1
- Who is married? I-1 & I-2, II-2 & II-3

18. How is sex-linked trait inherited?

21. Do a cross between a carrier female ( $X^H X^h$ ) and a normal male ( $X^H Y$ )


Who has the trait? 1 male child

22. Match the following disease with cause/symptoms

- c 1. Turners Syndrome                      a. trisomy 21
- d 2. Klinefelter's Syndrome              b. central nervous system recessive
- b 3. Tay Sach's Disease                    c. XO
- f 4. Sickle Cell Anemia                    d. XXY
- e 5. Hemophilia                              e. bleeding disorder, sex-linked
- a 6. Down Syndrome                      f. codominant, blood shaped as sickles

23. Blood type is controlled by three alleles  $I^A$   $I^B$   $i$

- a. What are the genotypes possible for a person with A blood?  $I^A I^A$  or  $I^A i$
- b. What genotype does a person have with AB blood?  $I^A I^B$
- c. What genotype does a person have with O blood?  $ii$
- d. What are the genotypes possible for a person with B blood?  $I^B I^B$  or  $I^B i$

24. A man who is homozygous B is married to a woman with O blood.

- a. What blood type will all of their children have? B
- b. What is the genotype of the children?  $I^B i$

25. A man with AB blood is married to a woman with O blood. They have two natural children and one adopted child. Jane has type A blood, Bobby has type B blood and Grace has type O blood. Which child was adopted? Use a punnett square to prove your answer.

Grace

26. Use the following key for Colorblindness.  $X^C$   $X^c$  Y

Cross a colorblind man with a woman who is a carrier.

50%

What is the probability that their children will be colorblind? \_\_\_\_\_

27. In cats, the gene for calico (multicolored) cats is co-dominant. Females that receive a B and a R gene have black and orange splotches on white coats. Males can only be black or orange but never calico. Here is the genotype of a calico female.  $X^B X^R$

Show the cross of a female calico cat with a black male.

- a. What percentage of the kittens will be black and male?  $\frac{1}{0}$
- b. What percentage of the kittens will be calico and male?  $\frac{0}{0}$
- c. What percentage of the kittens will be calico and female? \_\_\_\_\_

28. In fruit flies, dumpy wings (d) are recessive to normal wings. (D) Cross a homozygous dumpy winged fly with a heterozygous normal fly. Give the phenotypic and genotypic ratios.

P: 1: 1

G: 1: 1

29. An alien race called Smileys show co-dominance in their eyes. The Smileys pictured below show the three types of Smileys.



- a. If a star-eyed smiley (homozygous) is crossed with a dot-eyed smiley (also homozygous), what will all of their offspring look like? Starry-dot eyed
- b. If two starry-dot Smileys are mated, what will be the phenotypic result? 1:2:1
- c. What is the phenotypic ratio of a cross between a starry-dot Smiley and a dot-eyed Smiley? 1:1

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