

Monohybrid Cross Worksheet

Name _____
Period _____

Part A: Vocabulary

Match the definitions on the left with the terms on the right.

- | | |
|--|-----------------|
| _____ 1. genotypes made of the same alleles | A. alleles |
| _____ 2. different forms of genes for a single trait | B. dominant |
| _____ 3. gene that is always expressed | C. heterozygous |
| _____ 4. gene that is expressed only in the homozygous state | D. homozygous |
| _____ 5. genotypes made of two different alleles | E. recessive |

Below each of the following words are choices. Circle the choices that are examples of each of those words.

6. Dominant allele
D e k L N n R S
7. Recessive allele
M n d F G r k P
8. Homozygous dominant
AA Gg Kk mm uu Rr Tt
9. Homozygous recessive
ee Ff Hh Oo qq Uu ww
10. Genotypes in which dominant gene must show
AA Dd Ee Ff Tt Jj Rr Ss
11. Genotypes in which recessive gene must show
aa Gg Ff Kk rr Oo Tt

Part B: Punnett Squares

12. Examine the following Punnett squares and circle those that are correct.

d	D
Dd	dd
Dd	dd

d	D
Dd	DD
Dd	Dd

A	a
AA	aa
Aa	Aa

a	A
Aa	aa
Aa	aa

13. What do the letters on the outside of the Punnett square stand for? _____

14. What do the letters on the inside of the Punnett square stand for? _____

15. In corn plants, normal height, *N*, is dominant to short height, *n*. Complete these four Punnett squares showing different crosses. Then, shade red all the homozygous dominant offspring. Shade green all the heterozygous offspring. Leave all the homozygous recessive offspring unshaded.

n	N
N	n
n	n

N	n
N	n
N	n

N	n
n	N
n	n

n	N
n	n
n	n

16. In guinea pigs, short hair, *S*, is dominant to long hair, *s*. Complete the following Punnett squares according to the directions given. Then, fill in the blanks beside each Punnett square with the correct numbers.

a. One guinea pig is *Sr* and one is *sr*.

Expected number of offspring:
 _____ Short hair (SS or Ss)
 _____ Long hair (ss)

b. Both guinea pigs are heterozygous for short hair.

Expected number of offspring:
 _____ Short hair
 _____ Long hair

Part C: Monohybrid Cross Problems - Show your work.

17. Hornless (H) in cattle is dominant over horned (h). A homozygous hornless bull is mated with a homozygous horned cow. What will be the genotype and phenotype of the first generation?

P₁
F₁

18. In tomatoes, red fruit (R) is dominant over yellow fruit (r). A plant that is homozygous for red fruit is crossed with a plant that has yellow fruit. What would be the genotypes and

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Part A: Vocabulary

Match the definitions on the left with the terms on the right

1. genotypes made of the same alleles **A. alleles**
 2. different forms of genes for a single trait **B. dominant**
 3. gene that is always expressed **C. heterozygous**
 4. gene that is expressed only in the homozygous state **D. homozygous**
 5. genotypes made of two different alleles **E. recessive**

Below each of the following words are choices. Circle the choices that are examples of each of those words.

6. Dominant allele **(D, L, N, R, S)**
 7. Recessive allele **(e, k, m, f, k, p)**
 8. Homozygous dominant **(AA, GG, KK, uu, Rr, TT)**
 9. Homozygous recessive **(ee, ff, hh, oo, qq, uu, vv, ww)**
 10. Genotypes in which dominant gene must show **(AA, Dd, Ee, Ff, Jj, Rr, Ss)**
 11. Genotypes in which recessive gene must show **(aa, gg, ff, kk, ii, oo, tt)**

Part B: Punnett Squares

12. Examine the following Punnett squares and circle those that are correct.

d	D
Dd	dd
Dd	dd

d	D
Dd	DD
Dd	Dd

A	a
AA	aa
Aa	Aa

a	A
Aa	aa
Aa	aa

13. What do the letters on the outside of the Punnett square stand for? PARENTS

14. What do the letters on the inside of the Punnett square stand for? POSSIBILITY OF OFFSPRING - OUTCOMES

15. In corn plants, normal height (N) is dominant to short height (n). Complete these four Punnett squares showing different crosses. Then, shade red all the homozygous dominant offspring. Shade green all the heterozygous offspring. Leave all the homozygous recessive offspring unshaded.

n	N
Nn	Nn
Nn	Nn

N	n
NN	Nn
NN	Nn

N	n
Nn	Nn
Nn	Nn

n	N
Nn	Nn
Nn	Nn

16. In guinea pigs, short hair (S) is dominant to long hair (s). Complete the following Punnett squares according to the directions given. Then, fill in the blanks beside each Punnett square with the correct numbers.

a. One guinea pig is Ss and one is ss.

S	s
Ss	Ss
Ss	ss

Phenotype ratio 2 short hair (SS or Ss) : 2 Long hair (ss)
 Expected number of offspring: 2 Short hair (SS or Ss), 2 Long hair (ss)

b. Both guinea pigs are heterozygous for short hair.

S	s
Ss	Ss
Ss	ss

Phenotype ratio 3 Short hair : 1 Long hair
 Expected number of offspring: 3 Short hair, 1 Long hair

Part C: Monohybrid Cross Problems - Show your work.

17. Hornless (H) in cattle is dominant over horned (h). A homozygous hornless bull is mated with a homozygous horned cow. What will be the genotype and phenotype of the first generation?

F₁ 4 hornless

H	h
Hh	Hh
Hh	Hh

Phenotype ratio 4 : 0
 genotype h

18. In tomatoes, red fruit (R) is dominant over yellow fruit (r). A plant that is homozygous for red fruit is crossed with a plant that has yellow fruit. What would be the genotypes and phenotypes of the first generation?

F₁ 4 heterozygous

R	r
Rr	Rr
Rr	Rr

Phenotype ratio 4 : 0
 genotype h

all offspring are Rr

phenotypes of the P₁ and F₁ generations?

P₁ RR x rr

F₁ Rr x Rr

phenotype ratio: red yellow
genotype ratio: RR Rr rr

19. If two of the F₁ generation from the above cross were mated, what would be the genotypes and phenotypes of the F₂?

F₁ Rr x Rr

F₂ RR Rr rr

20. In humans, being a tongue roller (R) is dominant over non-roller (r). A man who is a non-roller marries a woman who is heterozygous for tongue rolling. R roller r non-roller

Father's phenotype: Non-roller
Mother's phenotype: roller

r	R
R	Rr
r	rr

What is the probability of this couple having a child who is a tongue roller? 50%

21. Brown eyes in humans are dominant to blue eyes. A brown-eyed man, whose mother was blue-eyed, marries a brown-eyed woman whose father had blue eyes. What is the probability that this couple will have a blue-eyed child?

B brown
b blue

Man (brown) Bb
Woman (blue) bb
Dog (blue) bb
Woman (brown) Bb

phenotype ratio: 3:1

genotype ratio: 1:2:1

homo hetero homo

TEST CROSS) OFFSPRING ARE GIVEN

22. In pea plants, yellow seeds (Y) are dominant and green seeds (y) are recessive. In another cross, a yellow seeded plant was crossed with another yellow seeded plant and it produced offspring of which about 25% were green seeded plants. What are the genotypes of both parents?

Y yellow y green
P: yellow x yellow → F₁ 25% green

Y	y
Y	YY
y	Yy
y	Yy
y	yy

100% yellow

23. In guinea pigs, short hair (S) is dominant to long hair (s). What are the genotypic and phenotypic ratios of a cross between a heterozygous short haired guinea pig with a long haired guinea pig?

S - short s - long

S	s
S	SS
s	Ss
s	Ss
s	ss

SA x ll
phenotype ratio: 2:2
short long
hetero homo
short long

24. Hornless (H) in cattle is dominant over horned (h). A homozygous hornless bull is mated with a homozygous horned cow. What will be the genotype and phenotype of the first generation?

H hornless h horned

H	h
H	HH
h	Hh
h	Hh
h	hh

HH x hh

phenotype ratio: 4:0

genotype ratio: 4:0

hornless horn