

Lesson 6.8 Genetics Review (Make Up)

Name _____

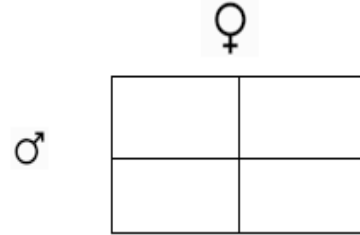
Date _____

Period _____

Simple Mendelian Inheritance: Complete Dominance (refer to 6.5 for help)

1. In a certain species of dragons, long tails dominate short tails. Cross a homozygous long tail drake with a short tail dragonette.

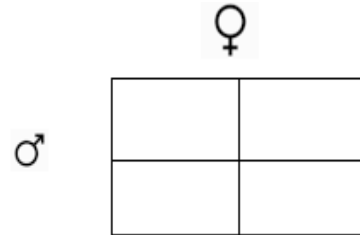
- A. Use 6.12 to Assign Symbols (alleles): $_ = _$ and $_ = _$
- B. Show the cross $_ _ \times _ _$
- C. Complete the Punnett square
- D. List genotypic percentages
- E. List phenotypic percentages



2. In humans the allele for albinism is recessive to the allele for normal skin pigmentation. Cross a heterozygous male with an albino female.

Alleles: A = Normal melanin production and a = Albino (abnormal melanin production)

- A. Show the cross $_ _ \times _ _$
- B. Complete the Punnett square
- C. List genotypic ratios
- D. List phenotypic ratios



Non-Mendelian: Polygenic Inheritance (refer to 6.7 for help)

3. Take a look at the dragon genome worksheet and the genes for back spikes located on the C, J, and W. All three genes can contribute to the overall number of back-spikes on a dragon.

Write down the number of back spikes for dragons with the following genotypes (show work for each):

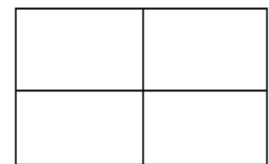
- a) CcJjww $_ + _ + _ = _$
- b) CCJJww $_ + _ + _ = _$
- c) ccJjWW $_ + _ + _ = _$

Non-Mendelian: Incomplete Dominance (refer to 6.7 for help)

4. In radishes, the gene that controls color exhibits incomplete dominance. Pure-breeding red radishes crossed with pure-breeding white radishes make a pink radishes. Cross a pink radish with a red radish.

Alleles: R = red and W = white

- A. Show the cross $_ _ \times _ _$
- B. Complete the Punnett square
- C. List genotypic percentages
- D. List phenotypic percentages

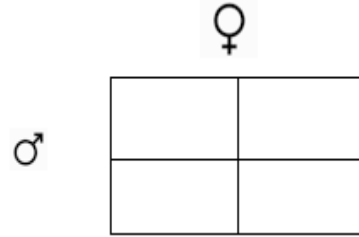


E. If you ended up with 40 radishes, predict how many (give a number) of them would be red. (SHOW YOUR WORK).

Non-Mendelian: Codominance (refer to 6.6 for help)

5. Jean was blood type B and she knew her father was blood type O. She married Gene and they wanted to have 16 children! Gene's blood type was AB.

- A. Show the cross ____ x ____
- B. Complete the Punnett square
- C. List genotypic ratios
- D. List phenotypic ratios



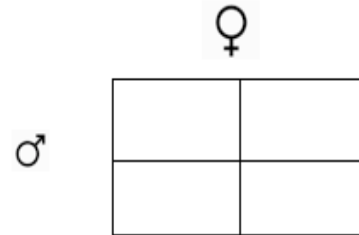
E. If they ended up having 16 children, predict how many would be blood type B. Show your work.

Non Mendelia: Sex-linked Inheritance (refer to 6.7 for help)

6. Fire breathing is a recessive sex-linked condition. Imagine a non-fire breathing drake has offspring with a carrier dragonette. Alleles: X^F = non-fire breathing and X^f = fire breathing

- A. Show the cross ____ x ____
- B. Complete the Punnett Square

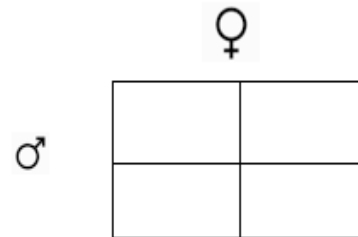
- ____/4 or ____% are non-fire breathing females (include noncarrier and carrier)
- ____/4 or ____% are fire breathing females
- ____/4 or ____% are non-fire-breathing males
- ____/4 or ____% are fire breathing males



7. Genes for color-blindness are located on the X-chromosomes in humans. Color blindness (X^n) is a recessive trait and normal vision is dominant (X^N). Jose color blinded. He marries Marilyn who is not color blind but her father is. They end up having 8 boys and 8 girls!

- A. Show the cross ____ x ____
- B. Complete the Punnett Square

- ____/4 or ____% are normal females (include noncarrier and carrier)
- ____/4 or ____% are colorblind females
- ____/4 or ____% are normal males
- ____/4 or ____% are colorblind males



C. How many (give a number) of their children are probably color-blind? Show your work.

D. How many (give a number) of their boys are probably color-blind? Show your work.

E. How many of their girls are most likely carriers for the color-blind trait? Show your work.

DRAGON GENOME: *DECODING OF THE GENES*

Chromosome	Dominant genes	Recessive genes (<i>unless otherwise noted!</i>)
Green Autosome	A. chin spike B. Rounded tail spikes C. 2 Back spikes D. visible ear hole E. Eye pointed at each end	a. no chin spike b. Pointed tail spikes [codominance] c. No back spikes [incomplete dominance / polygenic] d. no visible ear hole e. Oval eyes [codominance]
Red Autosome	F. long neck G. no back hump H. 4 clawed feet I. long tail J. 2 Back spikes	f. short neck g. large back hump [Incomplete dominance] h. 3 clawed feet i. short tail j. No back spikes [incomplete dominance / polygenic]
Blue Autosome	K. red eyes L. spots on neck M. wings N. no fangs O. spots on back	k. yellow eyes l. no spots on neck m. no wings n. fangs o. no spots on back
Yellow Autosome	P. blue spots on thigh Q. Bright Green R. small comb on head S. [See below] T. no elbow spike	p. gold spots on thigh q. Purple [Incomplete dominance] r. large comb on head s. [See below] t. elbow spike
Both Sex Chromosomes	U. long arms V. chest plate W. 2 Back Spikes	u. short arms v. no chest plate w. No back spikes [incomplete dominance / polygenic]
X Chromosome only	X ^Z . nose spike X ^F non-fire breather	X ^z . no nose spike X ^f fire breather

Codominant Traits

BB rounded tail spikes	Bb Rounded & Pointed tail spikes	bb pointed tail Spikes
EE Eye pointed at each end	Ee Eye round at front only	ee Oval eye

Incomplete Dominant Traits

GG no back hump	Gg small back hump	gg large back hump
QQ. Bright green body color	Qq. Dark Olive body color	qq. Purple body color
CC. Two back spikes	Cc. One back Spike	cc. No back Spikes
JJ. Two back spikes	Jj. One back Spike	jj. No back Spikes
WW. Two back spikes	Ww. One back spike	ww. No back spikes

Polygenic Inherited Trait

Back spikes are an example of polygenic inheritance. Dragons can have 0 – 6 spikes along the crest of their spine depending on the alleles found at loci C, J, and W. In order to determine total number of back spikes, add the numbers that each genotype results in.

Sex-linked Traits

Nose spikes and fire-breathing (both X-linked)