Goat Genetics Activity

The following are three student samples of the goat genetics activity. This activity was supplemented with class discussions about why particular traits were chosen and to discuss the rate of success in obtaining the desired offspring.

Sample 1:

droup	Names: Hour Date:
Date A	Assignment is due: Why late? Score: + ✓
Direct	ions: Complete this lab in your assigned groups of 2. Use two pennies (or Rock, Paper, Scissors) to determine the
genoty	ype and phenotype of your goat. Each gene mentioned in this lab is a simply inherited trait, meaning every goat
oin re	ly two alleles for that trait. For each trait, you will flip two coins. Each coin represents an allele. <u>Heads</u> on each expresents an allele for the <u>dominant</u> trait and <u>tails</u> represents the <u>recessive</u> allele. For example, if you got heads
on one	e coin and tails on the other, your goat would be heterozygous for that trait. If you got tails on both coin-flips, th
goat w	rould have the recessive phenotype for that trait. Perform two coin flips for each trait and record the genotype o
our g	oat for each trait. Then record the phenotype created by the genotype. Finally, draw your goat created by its
enoty	pe and phenotype and answer the questions in back.
raits:	
- i aits.	Horns: Dominant: no horns (polled); Recessive: horns
-	Wattle (lobe found on the neck): Dominant: wattle; Recessive: no wattle
-	Hair: Dominant: long hair; Recessive: short hair
-	Ears: Dominant: long ears; Recessive: short ears
-	Behavior: Dominant: Nervous; Recessive: Docile (tame)
-	Markings: Dominant: Alpine; Recessive: Solid colored
1.	Horns: Coin 1: Heads Tails . Coin 2: Heads Tails
	Genotype: HA Hh hh Phenotype: OO NCCDS
2:	Wattle: Coin 1: Heads Tails Coin 2: Heads Tails
	Construe WAY (W)
	Genotype: WW (Ww) ww Phenotype: Wat I (
3.	Hair: Coin 1: Heads Tails Coin 2: Heads Tails
	Contract O II II
	Genotype II II Phenotype: 1000 hair
4.	Ears: Coin 1: Heads Tails Coin 2: Heads
	Shoot and the shoot are the shoot and the shoot are the sh
	Genotype: EE Ee ee Phenotype: Short ears
5.	Behavior: Coin 1: Heads Tails Coin 2: Heads Tails
	Genotype BB Bb bb Phenotype: Norvous
6.	Markings: Coin 2: Heads Tails Coin 2: Heads
	Olatio.
	Genotype: MM (Mm) mm Phenotype: +101he

7. Describe your goat before based on the six traits you flipped for.

The	goat	has	no ho	rns	and H	hios	aw	attle. T	he go	cat
also	has	long	hair	and	short	r e	ars.	Also	it	
has	a	DELAÇ	us b	ehavio	of and	1	has	alpin	e mo	ir kings.
						1				
-	æ				1.00 <u>1.00 1.00 1.00 1.00 1.00 1.00 1.00</u>					

8. Draw your goat below.



9. Next, identify three traits that you think are most valuable in your goats and list them below:
Trait Behavior: Our goat is nervos but we want tomeness (R)
Trait Hair: Long hair for fabric + (It has long hair) (D)
Trait Horns: Long horns, to defend themselves (R) NOTE: these can be any of the six traits; for example, if your goats are docile, this might help them to sell as pets. If your goats have long hair, they might sell well for making fabrics. Pick three traits that make your goats the
most valuable for production traits or sale value.
10. After each trait above, state whether it is dominant or recessive.
11. Next, choose another person's goat to mate with. List the genotypes and phenotypes for your goat's mate below for all six traits:
Phenotype hornS Genotype hh
Phenotype Wattke Genotype WW
Phenotype king hair Genotype Ll
Phenotype LONG COLFS Genotype Le
Phenotype Vervous Genotype Blo
Phenotype Alpine Genotype M.m.
12. In the space below, do a Punnett Square for the three traits you chose above. Use the genotype of your goat Below and the genotype of the mate of your goat (a goat from another group).
8 b
B BB Bh L LL LI H Hh Hh
8 BB 186 1 L LL LI L L/ Kh
4:0 + Nervous 4:0 + Longhow 7:2 Horns
13. In the space below, describe what the offspring of your goat pair will most likely look like.
It will most likley be nervous and have long hair. The
other traits are a 212 chance or 63 to 1 chance.
COPYRIGHT CRAIG KOHN, WATERFORD WI 2012. AVAILABLE FOR PUBLIC USE PROVIDED THE AUTHOR IS CITED. Agricultural Sciences



Sample 2:

Goat Mendelian Genetics Worksheet by C Kohn, WUHS

Group	Names:			Hour	Date:	
Date As	ssignment is due	Day of Week	Why late?	If your project was	Score: + / -	
genoty has onl coin re- on one goat we	pe and phenoty, y two alleles for presents an allel coin and tails or ould have the re	his lab in your as pe of your goat. that trait. For e e for the <u>domin</u> n the other, you cessive phenoty	ssigned groups of 2. Each gene mention each trait, you will fli ant trait and tails re r goat would be hete pe for that trait. Per	Use two pennies (or Rock ed in this lab is a simply in the presents the recessive allowers and the trait. If the form two coin flips for ead by the genotype. Finally	k, Paper, Scissors) to herited trait, mean presents an allele. ele. For example, if f you got tails on bo och trait and record	ning every goat <u>Heads</u> on each you got heads th coin-flips, the the genotype of
genoty	pe and phenoty	pe and answer t	he questions in back	a Milalas a No	florat forms	of a gene-
Traits: 1.	Ears: Dominant Behavior: Dom	:: long hair, Rece :: long ears; Rece inant: Nervous;	essive: short nan Recessive: Docile (ta ecessive: Solid color	TX- If the allele ; Recessive: no wattle was the dominant, one ame)	gene is pod sould be gree he two allele e recessive; H Two of the minant OR	color, then of the gene on and yellow. Is are different YBRID. Some alleles;
	Genotype: HH	(Lin) bh	Phenotype:	Wo Horns (1	Polled)	
2.		Coin 1: Heads		Coin 2: Hea		-
	Genotype: WV	v· Ww ww	Phenotype:	Wattle		
3.	<u>Hair</u> :	Coin 1: Heads	Tails	Coin 2: Hea	ads Tails	
	Genotype: LL ((L) II	Phenotype:	Long Hair		
4.	Ears:	Coin 1: Heads		Coin 2: Hea	ads	
	Genotype: EE	Ee ee	Phenotype:	Short fars		
5.	Behavior:	Coin 1: Heads) Tails	Coin 2: Hea	ads	
	Genotype: BB	Bb bb	Phenotype:	Nervous		
6.	Markings:	Coin 1: Heads	Tails	Coin 2: Hea	ads Tails	
	Genotype: MM	1 (Mm) mm	Phenotype:	Alpine		-

Agricultural Sciences

Goat Mendelian Genetics Worksheet by C Kohn, WUHS

Group N	Names:			Ηοι	ırDate	9:	
Date As	signment is due	:	Why late?	If your	Score: +		
genotyphas only coin rep on one goat wo your go genotyp	oe and phenotypy y two alleles for oresents an allele coin and tails or ould have the ree at for each trait oe and phenotypy	that trait. For e e for the <u>domin</u> the other, you cessive phenoty . Then record the pe and answer t	ssigned groups of 2. Each gene mention ach trait, you will fliant trait and tails represent would be hete pe for that trait. Perepe phenotype create the questions in back	ed in this lab is a sip two coins. Each presents the receserozygous for that form two coin flip d by the genotype where the coin flip d by the gen	imply inherited coin represents sive allele. For e trait. If you got s for each trait a. Finally, draw y	trait, meaning an allele. Hexample, if you tails on both and record the our goat cre	ng every goat eads on each ou got heads n coin-flips, the ne genotype of ated by its
	Ears: Dominant Behavior: Domi Markings: Domi Horns:	:: long ears; Receinant: Nervous; inant: Alpine; Re		the free dominarime) Heterozygou One dominarime Homozy ed either two	the gene alleles or fittle would be the two the two the feces govs: Two of dominants. Heads	is pod coms of orms of green alleles sive: HY	alof, then the gene and yellow. are different
	Genotype: HH Wattle:	Coin 1: Heads	Phenotype:		2: Heads	Tails	
3.	Genotype: WW Hair: Genotype: LL (Coin 1: Heads	Phenotype:Phenotype:		2: (Heads)	Tails	: 3
	Ears:	Coin 1: Heads		0	2: Heads	Tails	
5.	Genotype: EE Behavior:	Ee ee Coin 1: Heads	Phenotype:	1	2: Heads	Tails	
6.	Genotype: BB Markings:	Bb bb Coin 1: Heads	Phenotype:	Nervous Coir	2: Heads	Tails	
	Genotype: MN	1 (Mm) mm	Phenotype:	Alpine			



7. Describe your goat before based on the six traits you flipped for.

Cur goat is cheddar, he has no horns, otherwise known to be polled. Cheddar has a small wattle, and is covered in Long hair with distinct black Alpine markings covering his browned hair body. Cheddars short ears top off his nelvous personality.

8. Draw your goat below.





9. Next, identify three traits that you think are most valuable in your goal	ts and list them below:
Dominant Trait His Long hair, it will be good	for making fabrics.
Pominant Trait He won't be aggressive without	his horns. It is
1) ONT I WILL	Always on alert).
NOTE: these can be any of the six traits; for example, if your goats are a lift your goats have long hair, they might sell well for making fabrics. Pic most valuable for production traits or sale value.	
10. After each trait above, state whether it is dominant or recessive.	
11. Next, choose another person's goat to mate with. List the genotypes a below for all six traits:	and phenotypes for your goat's mate
Phenotype Phine	Genotype MM
Phenotype 301 CM	Genotype ee
Phenotype daile	Genotype bb
Phenotype HOWS	Genotype h
Phenotype 1034He	Genotype ()()
Phenotype Stort Lair	Genotype
12. In the space below, do a Punnett Square for the three traits you chose and the genotype of the mate of your goat (a goat from another group	I MAJERINES
e e h Hh hh 2=2	MM Mm De Personality
e ce ce Horis Li II.	9:9 BP PP
6 La 10/10/10/10/10/10/10/10/10/10/10/10/10/1	b 86 bb
4:0 W WW WW 7:3	5:9
13. In the space below, describe what the offspring of your goat pair will n	
the offering will have short ears, wat	
likely have short have, havens, + a docid	e townsylv.
COPYRIGHT CRAIG KOHN, WATERFORD WI 2012. AVAILABLE FOR PUBLIC USE PROVIDED THE AUTHOR IS CITED.	A Arricultural Science

Sample 3:

Goat Mendelian Genetics Worksheet by C Kohn, WUHS Group Names: Date Assignment is due: Why late? Directions: Complete this lab in your assigned groups of 2. Use two pennies (or Rock, Paper, Scissors) to determine the genotype and phenotype of your goat. Each gene mentioned in this lab is a simply inherited trait, meaning every goat has only two alleles for that trait. For each trait, you will flip two coins. Each coin represents an allele. Heads on each coin represents an allele for the dominant trait and tails represents the recessive allele. For example, if you got heads on one coin and tails on the other, your goat would be heterozygous for that trait. If you got tails on both coin-flips, the goat would have the recessive phenotype for that trait. Perform two coin flips for each trait and record the genotype of your goat for each trait. Then record the phenotype created by the genotype. Finally, draw your goat created by its genotype and phenotype and answer the questions in back. Traits: Horns: Dominant: no horns (polled); Recessive: horns Wattle (lobe found on the neck): Dominant: wattle; Recessive: no wattle Hair: Dominant: long hair; Recessive: short hair Ears: Dominant: long ears; Recessive: short ears Behavior: Dominant: Nervous; Recessive: Docile (tame) Markings: Dominant: Alpine; Recessive: Solid colored 1. Horns: Coin 1: Heads Tails, Coin 2: Heads (Tails Genotype: HH Hh (hh) Phenotype: Tails F Coin 1: Heads (Tails) Coin 2: (Heads 2. Wattle: Genotype: WW (Ww) Phenotype: Coin 2: (Heads) 3. **Hair**: Coin 1: Heads Tails Tails Genotype: LL (LI) II Phenotype: Tails 4. Ears: Coin 1: (Head: Coin 2: Heads Tails Genotype: EE (Ee) ee Phenotype: 5. Behavior: Coin 1: Heads Tails Coin 2: (Heads Tails Genotype: BB (Bb) bb Phenotype: Coin 1: (Heads Markings: Tails Coin 2: Heads



Phenotype:

mm

Genotype: MM (Mm)

7. Describe your goat before based on the six traits you flipped for.

Our goat will have horns, wattie, long hair, long ears, nervous behavior, and marking. Our goat will have all of the dominant genes except for the horns. Perfore we slipped for the traits the goat didn't have any of these characteristics. This is what are goat will have for his traits.

8. Draw your goat below.



	9.	9. Next, identify three traits that you think are most valuable in your goats and	list them below:
		Trait Horps to defend themselves	
		Trait Hair - Long For Fabric	
		Trait Benayar-It's furny if its novas	
		NOTE: these can be any of the six traits; for example, if your goats are docile. If your goats have long hair, they might sell well for making fabrics. Pick three	
		most valuable for production traits or sale value.	ee traits that make your gouts the
	10	10. After each trait above, state whether it is dominant or recessive.	
	11	11. Next, choose another person's goat to mate with. List the genotypes and ph	nenotypes for your goat's mate
		below for all six traits:	
		Phenotype 00 Nom6 Ger	notype Hh
1		Phenotype Wattle Ger	notype (N)W)
		Phenotype Ing how Ger	notype
		Phenotype Share eurs Ger	notype CC
		Phenotype Vervous Ger	notype BB
		Phenotype Alpine Ger	notype Mm
	12	12. In the space below, do a Punnett Square for the three traits you chose above	
		and the genotype of the mate of your goat (a goat from another group).	Behavior b
		H	2 22 24
h	-	Hh hh	D 00 B0
, ,	-		B DO BL
1		HA INN L L	BB 00
		2:2	2:2
	13	13. In the space below, describe what the offspring of your goat pair will most li	kely look like.
		Or goot will most libely have home	, long hair,
		remote behavior wattle, short cars, and	the alpine marking:
Соя	YRIGH	RIGHT CRAIG KOHN, WATERFORD WI 2012. AVAILABLE FOR PUBLIC USE PROVIDED THE AUTHOR IS CITED.	Agricultural Sciences