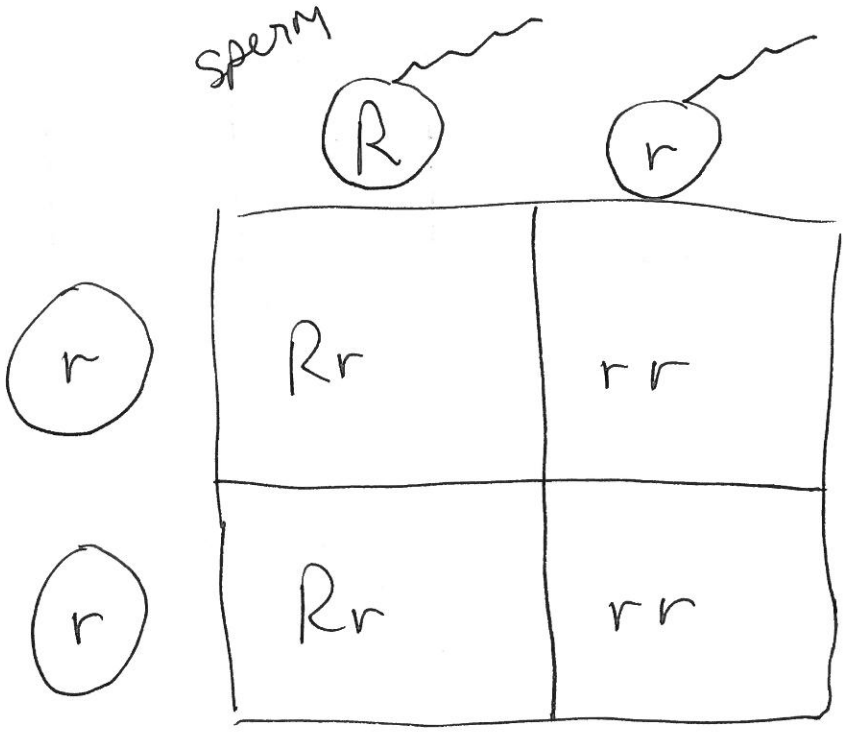
MONOHYBRID

1.

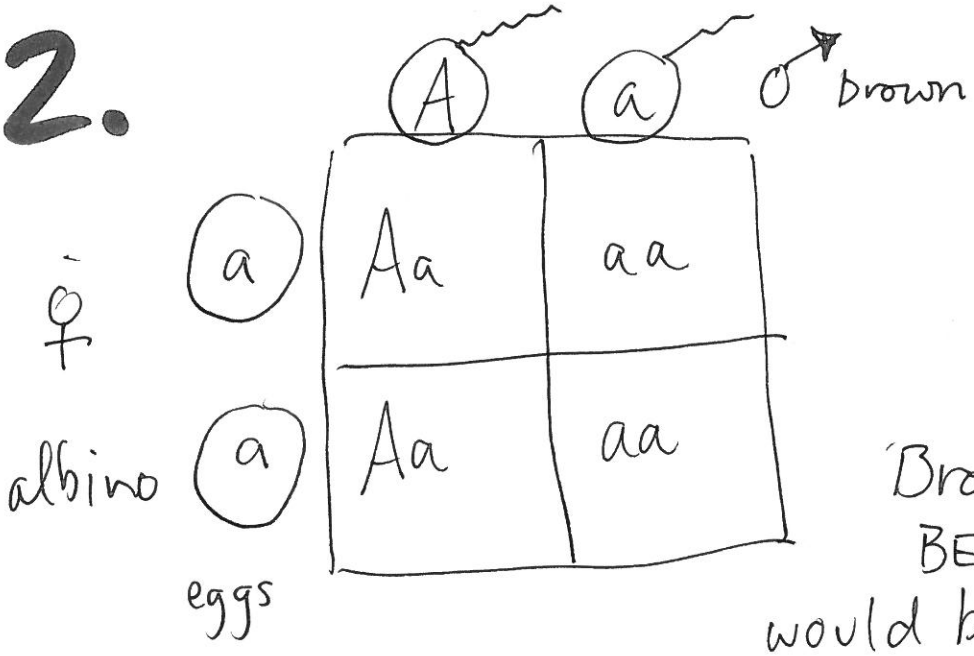


geno pheno
RR, Rr = red
rr = pink

60 babies

genotype ratio 1:1
phenotype ratio 1:1
expected 30 babies PINK EYED
30 babies RED EYED

2.



AA, Aa = brown, normal
aa = albino

Brown parent CAN'T BE AA as there would be NO ALBINO offspring.

3.

♂

♀	b	b
b	bb	bb
b	bb	bb

BB, Bb = brown
bb = blue

No way to get a brown eyed child.

	B	B
b	Bb	Bb
b	Bb	Bb

No blue-eyed babies...

	B	b
B	BB	Bb
b	Bb	bb

Yes, if BOTH parents are heterozygous.

4. Incomplete Dominance ... looks like "blending"

♀ \ ♂	R	W
R	RR	RW
W	RW	WW

RR = red
WW = white
RW = roan

also
C^RC^R = red
C^WC^W = white
C^RC^W = roan

True breeding? NO

definition: only form present for many generations ... Even if you breed roan horses with other roans, you get some reds and whites.

5.

	D	d
D	DD	Dd
d	Dd	dd

genotype ratio 1:2:1
DD / Dd / dd

parents
Dd
→ diabetic child

6.

	S	s
s	Ss	ss
s	Ss	ss

SS, Ss = short

ss = long

If one of their parents was long haired, the short haired pig referenced must be Ss.

Short : long haired babies

genotype ratio 1:1 pheno ratio 1:1

7.

	Rh+	Rh−
Rh+	++	+−
Rh−	+−	−−

geno: pheno:

Rh+Rh+ = Rh+

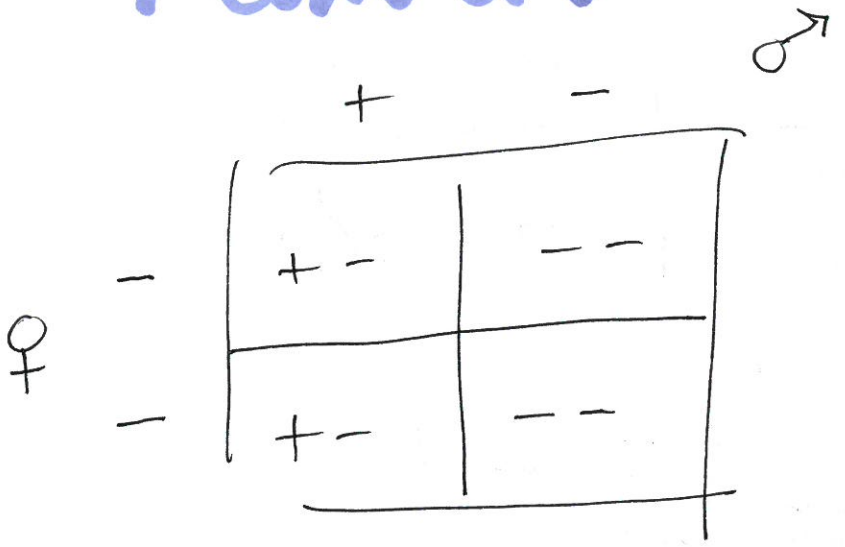
Rh+Rh− = Rh+

Rh−Rh− = Rh−

Only if the parents are heterozygous, can you get an Rh− child.

geno ratio 1:2:1 pheno 3:1

7 cont'd.

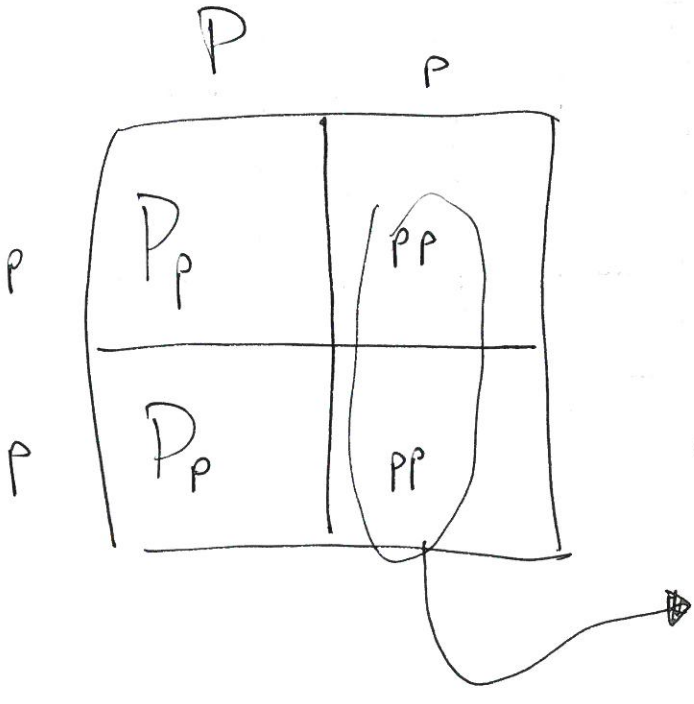


If father was Rh−, and he is Rh+, then he must be heterozygous, or Rh+ Rh−

Blood groups (phenotypes) = BOTH

genotypes = Rh+Rh− or Rh+Rh+

8.



PP, Pp = extra finger, polydactylous

lower case pp = normal

probability of POLYDACTYLY = $\frac{1}{2}$ = 50%

= 0.5

DIHYBRIDS

9. PPBB × ppbb ⇒ All babies are heterozygous for both traits

↳ pheno. $P_p Bb$ = geno

↳ And they are all hornless and black.

Now a dihybrid cross with 2 organisms hetero for both traits yields

9:3:3:1 phenotype ratio

so 9 → dominant in both

3 → " " one

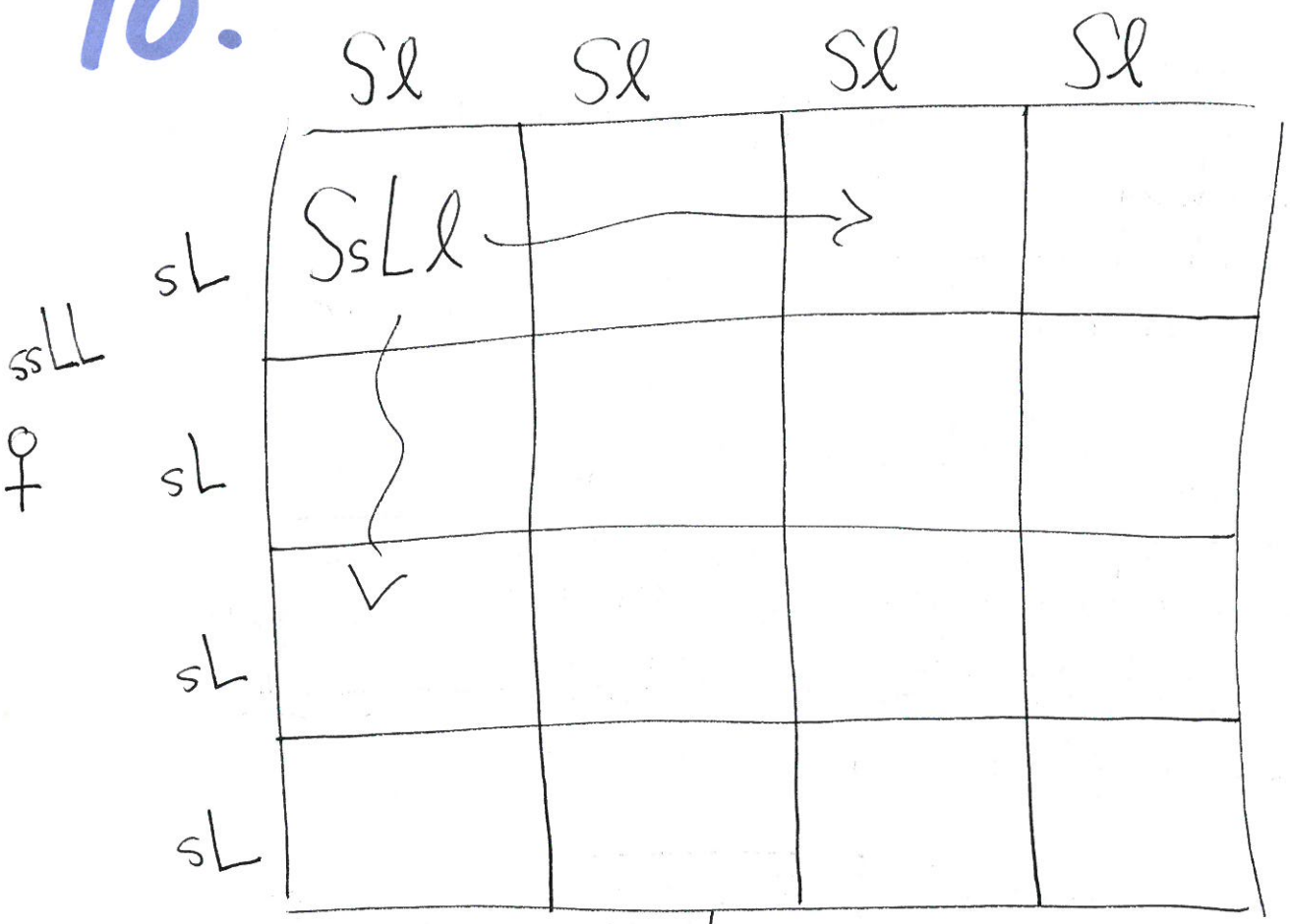
3 → " " the other

1 → recessive in both

See FIGURE 10.7 pg 194 in the book for more...

10.

SSll ♂



Cross SsLl yields
9:3:3:1
so, with
64 babies

Ss, SS = spotted
ss = solid

Ll, LL = short hair
ll = long hair

36 : 12 : 12 : 4

- 36 → spotted, short (DOM for Both)
- 12 → spotted long
- 12 → solid short (DOM in 1, recessive in the other)
- 4 → solid long (recessive for both)

SEX LINKED

Use Xs and Ys with alleles as superscripts

11.

♂

♀	X^B	Y
X^b	X^BX^b	X^bY
X^b	X^BX^b	X^bY

X^BX^b, X^BX^B = normal ♀

X^bX^b = colorblind ♀

X^bY = colorblind ♂

X^BY = normal

Sons = 100% colorblind

daughters = 100% are normal, but CARRIERS

12.

boy is X^bY

parents

	X^B	Y
X^B	X^BX^B	X^BY
X^b	X^BX^b	X^bY

grandparents

	X^B	Y
X^B	X^BX^B	X^BY (DAD)
X^b	X^BX^b	X^bY

13. I'm not sure this one works. If you have a way to solve it, let me know :).