

**Practice genetics problems for Bio 110: Pages C-28 and C-29 in lab manual**

**1. PP x pp**

	P	P
p	Pp purple	Pp purple
p	Pp purple	Pp purple

F1 Genotypic ratio= 100% Pp  
 F1 Phenotypic ratio= 100% purple

**Pp x Pp (“monohybrid cross”)**

	P	p
P	PP purple	Pp purple
p	Pp purple	pp yellow

F2 Genotypic ratio= 1:2:1 (25% homozy dom, 50% heterozy, 25% homozy rec)  
 F2 Phenotype ratio= 3:1 (75% purple, 25 % yellow)

**2. Cc x Cc (“monohybrid cross”)**

	C	c
C	CC green	Cc green
c	Cc green	cc white

*Survivor* genotypic ratio: 1:2:0 (only 75% off all progeny survive)  
*Survivor* phenotypic ratio: 1:0 (100% green)

**3. ff x Ff**

	F	f
f	Ff freckles	ff no freckles
f	Ff freckles	ff no freckles

50% of progeny will have freckles, 50% will not

4.  $C^W C^B \times C^W C^B$  (“monohybrid cross”)

	$C^W$	$C^B$
$C^W$	$C^W C^W$ white	$C^W C^B$ blue
$C^B$	$C^W C^B$ blue	$C^B C^B$ black

Genotypic ratio= 1:2:1

Phenotypic ratio= 1:2:1

5. Mrs. Brown x Mr. Brown

Baby could possibly be AB, B, or A. Therefore Baby 2 must be the Browns’.

	$I^B$	$I^B$ or $i$
$I^A$	$I^A I^B$	$I^A I^B$ or $I^A i$
$I^B$	$I^B I^B$	$I^B I^B$ or $I^B i$

Mrs. Jones x Mr. Jones

Baby could possibly be A or O. Therefore Baby 1 must be the Jones’.

	$I^B$	$I^B$ or $i$
$I^B$	$I^B I^B$	$I^B I^B$ or $I^B i$
$I^B$ or $i$	$I^B I^B$	$I^B I^B$ or $ii$

6. “True breeding” means that the traits are homozygous.

DDhh x ddHH

F<sup>1</sup> generation: all offspring are tall/hairy (16:0:0:0)

	Dh	Dh	Dh	Dh
dH	DdHh Tall/hairy	DdHh Tall/hairy	DdHh Tall/hairy	DdHh Tall/hairy
dH	DdHh Tall/hairy	DdHh Tall/hairy	DdHh Tall/hairy	DdHh Tall/hairy
dH	DdHh Tall/hairy	DdHh Tall/hairy	DdHh Tall/hairy	DdHh Tall/hairy
dH	DdHh Tall/hairy	DdHh Tall/hairy	DdHh Tall/hairy	DdHh Tall/hairy

DhDh x DhDh (“dihybrid cross”)

F<sub>2</sub> generation: 56% are tall/hairy, 19% are short/hairy, 19% are tall/hairless, 6% are short/hairless (**9:3:3:1**)

	DH	Dh	dH	dh
DH	DDHH Tall/hairy	DDHh Tall/hairy	DdHH Tall/hairy	DdHh Tall/hairy
Dh	DDHh Tall/hairy	DDhh Tall/hairless	DdHh Tall/hairy	Ddhh Tall/ hairless
dH	DdHH Tall/hairy	DdHh Tall/hairy	ddHh dwarf /hairy	ddHh Dwarf/hairy
dh	DdHh Tall/hairy	Ddhh Tall/hairless	DdHh Dwarf/ Hairy	ddhh dwarf/ hairless

7. CcSs x CcSs (“dihybrid cross”)

56% are normal/short, 19% are normal/long, 19% are c.f./short, 6% are c.f./long (9:3:3:1)

	CS	Cs	cS	cs
CS	CCSS Normal/short	CCSs Normal/short	CcSS Normal/short	CcSs Normal/short
Cs	CCSs Normal/short	CCss Normal/long	CcSs Normal/short	Ccss Normal/long
cS	CcSS Normal/short	CcSs Normal/short	ccSS c.f./short	ccSs c.f./short
cs	CcSs Normal/short	Ccss Normal/long	ccSs c.f./short	ccss c.f./long