

Notes: Incomplete & Codominance

I. Incomplete Dominance: (Neither is dominant)
 The phenotype of a heterozygote is an intermediate (blend) of the 2 homozygotes.

Example:

C = curly hair c = straight hair
 (could be written either way)

CC = Curly Hair Cc = Wavy Hair cc = Straight Hair

Information for Practice Problems:

R = Red Flower Petals r = White Flower Petals
 C = Curly Hair c = Straight Hair

Practice Problem #1: Cross the following flowers: Rr and Rr . Genotype ratio? Phenotype Ratio? Odds of having offspring with Red Flower Petals?

	R	r
R	RR	Rr
r	Rr	rr

$$GR = 1RR : 2Rr : 1rr$$

$$PR = 1 \text{ Red} : 2 \text{ Pink} : 1 \text{ White}$$

$$\text{Odds} = \frac{1}{4} = 25\%$$

Practice Problem #2: Cross a Wavy Haired Woman with a Straight Haired Man. Genotype Ratio? Phenotype Ratio? Odds of having Curly Haired offspring?

	C	c
c	Cc	cc
c	Cc	cc

$$GR = 0CC : 2Cc : 2cc$$

$$PR = 0 \text{ Curly} : 2 \text{ Wavy} : 2 \text{ Straight}$$

$$\text{Odds} = \frac{0}{4} = 0\%$$

II. Codominance:

Both alleles are equally expressed in the heterozygote.

Example:

B = Black BB = Black Bb = Speckled
b = White bb = white

Information for Practice Problems:

B = Black Fur b = White Fur
W = White Feathers w = Black Feathers

Practice Problem #1 Cross Bb and Bb parents. Genotype Ratio? Phenotype Ratio?

	B	b
B	BB	Bb
b	Bb	bb

GR = 1 BB : 2 Bb : 1 bb

PR = 1 Black : 2 Speckled : 1 white

Practice Problem #2 Cross a white-feathered chicken with a black-feathered chicken. Genotype Ratio? Phenotype Ratio?

	W	W
w	Ww	Ww
w	Ww	Ww

GR = 0 WW : 4 Ww : 0 ww

PR = 0 white : 4 speckled : 0 Black

III. Blood Type: An example of complete dominance and codominance.

Possible Alleles:

I^A
 I^B } Codominant
i - recessive

Possible Genotypes:

Possible Phenotypes:

$I^A I^A$ → A
 $I^A i$ → A
 $I^B I^B$ → B
 $I^B i$ → B
 $I^A I^B$ → AB
i i → O

Practice Problem #1: Cross the following individuals: $I^A I^A$ and $I^B i$

	I^A	I^A
I^B	$I^A I^B$	$I^A I^B$
<i>i</i>	$I^A i$	$I^A i$

Possible Genotypes of Offspring? $I^A I^B + I^A i$

Possible Phenotypes of Offspring? AB + A

Odds of having a child with Type O blood? 0%

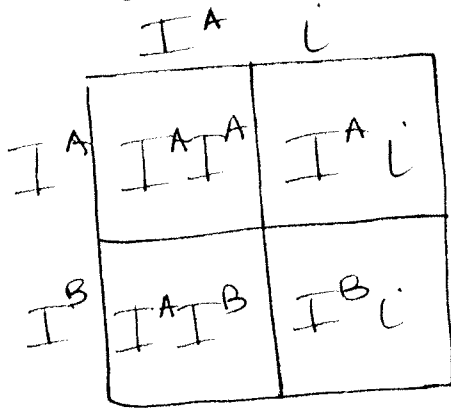
Practice Problem #2: Cross a Type O mother and a Type AB father. Possible Genotypes and Phenotypes of Offspring?

	<i>i</i>	<i>i</i>
I^A	$I^A i$	$I^A i$
I^B	$I^B i$	$I^B i$

G = $I^A i + I^B i$

P = A + B

Practice Problem #3: Cross a Type A woman whose mother was Type O with a Type AB man.
Possible genotypes and phenotypes of offspring?

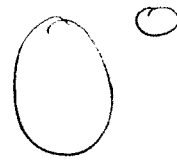
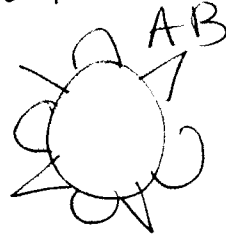
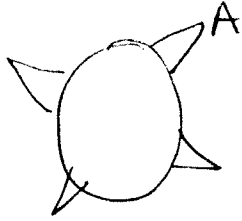


G = $I^A I^A, I^A i, I^A I^B, I^B i$

P = A, AB, B

What is an antigen?

A surface marker on a red blood cell.



Transfusions:

The transfer of blood from one individual to another.

Agglutination:

Clumping of blood that occurs when incompatible blood types are mixed.

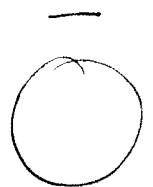
Blood Transfusion Table:

		DONORS			
		A	B	AB	O
Reipients	A	NO	NO	NO	yes
	B	Yes	Yes	Yes	Yes
	AB	No	Yes	No	Yes
	O	Yes	No	No	Yes

What about Positive and Negative Blood Types?

Rh factor = Another Antigen

Have it = + Blood
Don't = - Blood



$I^A I^+ = A+$

$I^A I^B - = AB-$

$O = O-$