

(2nd Worksheet)

GENETICS PROBLEMS - KEY.

1) a)

	W	w
w	Ww	ww
w	Ww	ww

g.r. = all Ww
 p.r. = all white.

b)

	W	w
w	Ww	ww
w	Ww	ww

g.r. = 2Ww : 2ww
 p.r. = 2 white : 2 yellow.

c)

	W	w
W	WW	Ww
w	Ww	ww

g.r. = 1WW : 2Ww : 1ww
 p.r. = 3 white : 1 yellow.

2.) Same as b above.

3.) B = brown b = blue.

	b	B
B	Bb	Bb
b	bb	bb

1/2 of their children will have blue eyes

4) No, but you can be somewhat encouraged by this fact. You will be a bit more sure on the 11th child, but you'll never really be completely sure.

5)

B	B	
Bb or Bb	bb	Bb
↓	↓	↓
man	x	woman
Bb		bb
↓		↓
father.		son.

for you know all of the genotypes except the man's father.

6) Inheritance is determined by incompletely dominant genes.

S	s
Ss	Ss
Ss	ss

SS = long
 Ss = short
 ss = none.



○ 7) $H = \text{normal}$ (haired) $h = \text{dead}$ $Hh = \text{hairless}$ (incomplete dominance)

1st cross:

	H	h
H	HH (normal)	Hh (1/2 hairless, 1/2 haired)
h	Hh	hh (dead)

2nd cross:

	H	h
H	HH	Hh
h	Hh	hh (dead)

1/3 haired : 2/3 hairless - because the dead pups don't count in the ratio!

8) a) p.r. = 9:3:3:1

b) $\frac{Ts}{ts} \times \frac{TtSs}{ttss}$ (8)

$gr = 1 TtSs : 1 ttSs$

$ph = 1 \text{ tall wrinkled} : 1 \text{ short wrinkled}$

c) $\frac{tS}{ts} \times \frac{TtSs}{ttss}$

$gr = 1 TtSs : 1 Ttss : 1 ttSs : 1 ttss$

$ph = 1 \text{ tall smooth} : 1 \text{ tall wr} : 1 \text{ short smooth} : 1 \text{ short wr}$

d) $\frac{Ts}{tS} \times \frac{TtSs}{ttss}$

$gr = \text{all } TtSs$

$ph = \text{all tall smooth}$

9) $W = \text{white belt}$ $S = \text{syndactyly}$

$W = \text{uniformly colored}$ $s = \text{normal hoofs}$

F1 $\frac{WwSs}{wwSs} \times \frac{WwSs}{WwSs}$ $gr = \text{all } WwSs$

$all = \text{white belted with syndactyly}$

F2 p.r. = 9:3:3:1

white uniform normal, syn normal, eye

10) $ggSs \times GgSs$ $G = \text{green}$ $g = \text{striped}$

$S = \text{short}$ $s = \text{long}$

Gs	$GgSs$	green short
Gs	$Ggss$	green long
gs	$ggSs$	striped short
gs	$ggss$	striped long

11) $Vvhh \times VvAh$ result (normal F₂)
 $V = \text{normal wings}$ $v = \text{vestigial wings}$
 $H = \text{normal body}$ $h = \text{hairy body}$

F₂ 9:3:3:1
 normal vest hairy + hairy

12) $Vvhh \times vvHh$ (normal: 1 vesth: 1 hairy: 1 vest+hairy)

Vh	vh
$VvHh$	$VvHh$
$Vvhh$	$vivh$

- 1) Breed 2 droop eared barkers, if any silent or erect eared offspring are produced, try another pair.
- 2) - repeat until a pair is found that only produces droop-eared barking pups.
- 3) Breed the droop-eared barkers with a silent, erect eared dog - see if all offspring are still droop-eared barkers. - if so, you can be reasonably certain that you have 2 pure breeds.

14) $I^A I^B \times I^A I^O$ 50% of their children will be type AB.

I^A	I^B	$I^A I^O$
$I^A I^A$	$I^A I^B$	$I^A I^O$
$I^B I^A$	$I^B I^B$	$I^B I^O$

15) $I^A I^O \times I^B I^O$ The Smith's could be the parents of either baby.

I^A	I^O
$I^B I^A$	$I^B I^O$
$I^O I^A$	$I^O I^O$

$I^A I^O \times I^A I^O$ The Jones can have a type O baby but not a type B baby.

I^A	I^O
$I^A I^A$	$I^A I^O$
$I^O I^A$	$I^O I^O$

So - Yes, A mixup had occurred.