Name: MS D 24680 Date: _____

Genetics Practice Problems

Define the following:

Genotype: What the genes say, "the letters"

Phenotype: What organism looks like, Physical appearance

Heterozygous: Dom/Rec (Aa)

Homozygous: Homozygous Dominant (AA), Homozygous Recessive (Aa)

Punnett Square: Tool to predict probable outcomes of offspring.

Answer the problems below:

1. For each genotype below, indicate whether it is heterozygous **(He)** or homozygous **(Ho)**

AA Ho Dom	Ee He	Ii He	Mm He
Bb He	ff Ho Rec	Jj He	nn Ho Rec
Cc He	Gg He	kk Ho Rec	oo Ho Dom
DD Ho Dom	HH Ho Dom	LL Ho Dom	Pp He

2. For each of the **genotypes** below determine what **phenotypes** would be possible.

Purple flowers are dominant to white flowers.

PP purple

Pp purple

pp white

Round seeds are dominant to wrinkled seeds.

RR Round

Rr Round

rr wrinkled

Brown eyes are dominant to blue eyes

BB Brown

Bb Brown

bb blue

Bobtails in cats are recessive.

TT normal tail

Tt normal tail

tt recessive tail

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3. For each **phenotype** below, list the **genotypes** (remember to use the letter of the dominant trait)

Straight hair is dominant to curly.

SS straight - Ho Dom

Ss straight He

SS curly

Pointed heads are dominant to round heads.

PP pointed Ho Dom

Pp pointed He

pp round

4. Set up the Punnet squares for each of the crosses listed below. *Round seeds are dominant to wrinkled seeds.*

Rr x rr

	R	r
r	Rr	rr
r	Rr	rr

What percentage of the offspring will be round? 50%.

RR x rr

	R	R
r	Rr	Rr
r	Rr	Rr

What percentage of the offspring will be round? 100%.

RR x Rr

	R	R
R	RR	RR
r	Rr	Rr

What percentage of the offspring will be round? 100%.

Rr x Rr

	R	r
R	RR	Rr
r	Rr	rr

What percentage of the offspring will be round? 75%.

Practice with Crosses. Show all work!

5. A TT (tall) plant is crossed with a tt (short plant).

	T	T
t	Tt	Tt
t	Tt	Tt

What percentage of the offspring will be tall? 100%.

6. A Tt plant is crossed with a Tt plant.

	T	t
T	TT	Tt
t	Tt	tt

What percentage of the offspring will be short? 25%.

7. A heterozygous round seeded plant (Rr) is crossed with a homozygous round seeded plant (RR).

	R	r
R	RR	Rr
R	RR	Rr

What percentage of the offspring will be homozygous (RR)? 50%.

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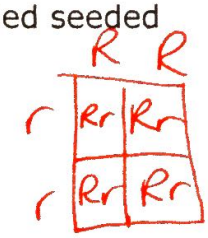
8. A homozygous round seeded plant is crossed with a homozygous wrinkled seeded plant.

What are the genotypes of the parents? RR x rr

What percentage of the offspring will also be homozygous? 0%



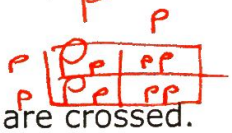
9. **In pea plants purple flowers are dominant to white flowers.** ww

If two white flowered plants are cross, what percentage of their offspring will be white flowered? 100%.

pp x pp

10. A white flowered plantis crossed with a plant that is heterozygous for the trait.

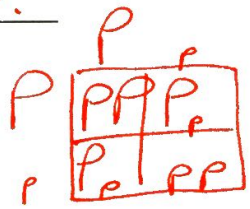
What percentage of the offspring will have purple flowers? 50%.



11. Two plants, both heterozygous for the gene that controls flower color are crossed.

What percentage of their offspring will have purple flowers? 75%.

What percentage will have white flowers? 25%.



12. In guinea pigs, the **allele for short hair is dominant.**

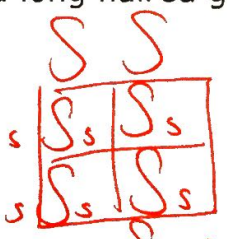
What genotype would a heterozygous short haired guinea pig have? Ss

What genotype would a purebreeding short haired guinea pig have? SS

What genotype would a long haired guinea pig have? ss

13. Show the cross for a pure breeding short haired guinea pig and a long haired guinea pig.

What percentage of the offspring will have short hair? 100%.



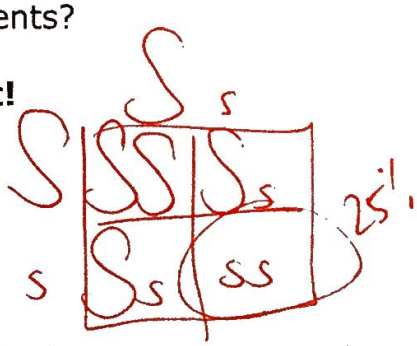
14. Show the cross for two heterozygous guinea pigs.

What percentage of the offspring will have short hair? 75%.

What percentage of the offspring will have long hair? 25%.

15. Two short haired guinea pigs are mated several times. Out of 100 offspring, 25 of them have long hair. What are the probable genotypes of the parents?

Ss x Ss **Show the cross to prove it!**



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Phenotype:

Heterozygous:

Homozygous:

Punnett Square:

Answer the problems below:

1. For each genotype below, indicate whether it is heterozygous **(He)** or homozygous **(Ho)**

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Bb _____	ff _____	Jj _____	nn _____
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DD _____	HH _____	LL _____	Pp _____

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Round seeds are dominant to wrinkled seeds.

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Rr _____

rr _____

Brown eyes are dominant to blue eyes

BB _____

Bb _____

bb _____

Bobtails in cats are recessive.

TT _____

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tt _____

Name: _____ Date: _____

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Straight hair is dominant to curly.

_____ straight

_____ straight

_____ curly

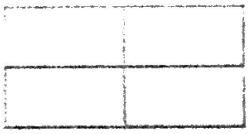
Pointed heads are dominant to round heads.

_____ pointed

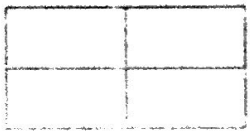
_____ pointed

_____ round

4. Set up the Punnet squares for each of the crosses listed below. *Round seeds are dominant to wrinkled seeds.*

Rr x rr 

What percentage of the offspring will be round?
_____

RR x rr 

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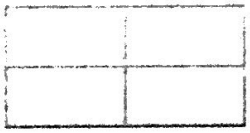
_____

RR x Rr 

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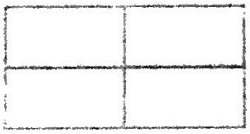
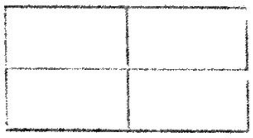
Rr x Rr 

What percentage of the offspring will be round?
_____

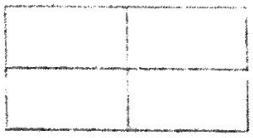
Practice with Crosses. Show all work!

5. A TT (tall) plant is crossed with a tt (short plant).



What percentage of the offspring will be tall? _____

6. A Tt plant is crossed with a Tt plant.



What percentage of the offspring will be short? _____

7. A heterozygous round seeded plant (Rr) is crossed with a homozygous round seeded plant (RR).

What percentage of the offspring will be homozygous (RR)? _____

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8. A homozygous round seeded plant is crossed with a homozygous wrinkled seeded plant.

What are the genotypes of the parents? _____ x _____

What percentage of the offspring will also be homozygous? _____

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What percentage of the offspring will have short hair? _____

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_____ x _____ **Show the cross to prove it!**