

## Genetics Practice Problems - KEY

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

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

*Brown eyes are dominant to blue eyes*

BB **Brown eyes**      Bb **Brown eyes**      bb **blue eyes**

*Bobtails in cats are recessive.*

TT **No Bob tail**      Tt **No Bob tail**      tt **bob tail**

*Round seeds are dominant to wrinkled seeds*

RR **round**      Rr **round**      rr **wrinkled**

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

*Straight hair is dominant to curly.*

**SS or Ss** straight      **ss** curly

*Pointed heads are dominant to round heads.*

**PP or Pp** pointed      **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

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

	<b>R</b>	<b>R</b>
<b>r</b>	<b>Rr</b>	<b>Rr</b>
<b>r</b>	<b>Rr</b>	<b>Rr</b>

Rr x rr

What percent of the offspring will be round? **50%**

	<b>R</b>	<b>r</b>
<b>r</b>	<b>Rr</b>	<b>rr</b>
<b>r</b>	<b>Rr</b>	<b>rr</b>

RR x Rr

What percent of the offspring will be round? 100%

	<b>R</b>	<b>R</b>
<b>R</b>	<b>RR</b>	<b>RR</b>
<b>r</b>	<b>Rr</b>	<b>Rr</b>

Rr x Rr

What percent of the offspring will be round? 75%

	<b>R</b>	<b>r</b>
<b>R</b>	<b>RR</b>	<b>Rr</b>
<b>r</b>	<b>Rr</b>	<b>rr</b>

5. A TT (tall) plant is crossed with a tt (short plant). What percentage of the offspring will be tall? 100%

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

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).

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

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.

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

10. A white flowered plant is 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? **Hh**

What genotype would a purebreeding short haired guinea pig have? **HH**

What genotype would a long haired guinea pig have? **hh**

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%

	<b>H</b>	<b>H</b>
<b>h</b>	<b>Hh</b>	<b>Hh</b>
<b>h</b>	<b>Hh</b>	<b>Hh</b>

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%

	<b>H</b>	<b>h</b>
<b>H</b>	<b>HH</b>	<b>Hh</b>
<b>h</b>	<b>Hh</b>	<b>hh</b>

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?

**Hh x Hh**

Show the cross to prove it!

	<b>H</b>	<b>h</b>
<b>H</b>	<b>HH</b>	<b>Hh</b>
<b>h</b>	<b>Hh</b>	<b>hh</b>