Total: _____/30 [T/I]

Name: _____

Due: _____

Worksheet: Mendelian Patterns of Inheritance

1. For each of the **genotypes** below determine what **phenotypes** would be possible. (3)

Purple flowers are dominant to white	*Brown eyes are dominant to blue*
PP _____	BB _____
Pp _____	Bb _____
pp _____	bb _____

2. *Straight hair is dominant to curly. Tail spikes are dominant to plain tails.* For each phenotype below, list all possible **genotypes** (remember to use the letter of the dominant trait). (3)

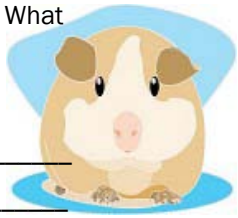
_____ straight	_____ spikes
_____ curly	_____ plain

3. A tall plant (TT) is crossed with a short plant (tt). What percentage of the offspring will be tall? (1) _____

4. a) A tall plant (TT) is crossed with another tall plant (Tt). Set up and complete a Punnett square for this cross. (2)

b) What percentage of the offspring will be tall? (1) _____

5. A heterozygous round-seeded plant (Rr) is crossed with a homozygous wrinkly-seeded plant (rr). What percentage of the offspring will be wrinkled? (1) _____

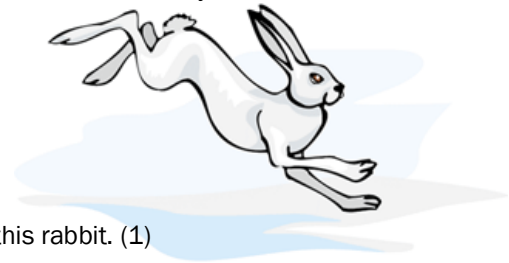


6. *In guinea pigs, the allele for short hair (H) is dominant to long hair (h).* (2)
   a) What possible genotype(s) would produce a short-haired guinea pig? _____
   b) What possible genotype(s) would produce a long-haired guinea pig? _____

7. A guinea pig has the phenotype for short hair. Describe an experiment you could perform to determine the genotype of the guinea pig. What would you expect to see if the guinea pig was homozygous? Heterozygous? (3)

8. Two short-haired guinea pigs are mated several times. Of 100 offspring, 25 of them have long hair. What are the most probable genotypes of each of the parents? Explain, using a Punnett square. (3)

9. *In rabbits, grey hair is dominant to white hair.* Also in rabbits, black eyes are dominant to red eyes. What are the **phenotypes** of rabbits that have the following genotypes? (2)



Ggbb _____ ggBB _____

ggbb _____ GgBb _____

10. A male rabbit has the genotype GgBb . Determine the gametes produced by this rabbit. (1)
Hint: there are 4 combinations.

_____

11. Two rabbits, both heterozygous for hair and eye colour, are mated several times. Of 200 offspring, determine how many of them will display the following phenotypes. *Round to the nearest whole number if necessary.* (2)

Grey hair, black eyes _____ White hair, black eyes _____

Grey hair, red eyes _____ White hair, red eyes _____

12. a) In humans, free earlobes (F) are dominant to attached earlobes (f), and a widow's peak hairline (W) is dominant to a straight hairline (w). A woman who is heterozygous for both characters marries a man with genotype *Ffww*. Set up and complete a Punnett square for this pairing. Put the female's gametes on top, and the male's gametes on the side. (3)

b) What is the probability that their children will display both recessive characters? (1) _____

13. A woman who is *FFWw* marries a man who is *FfWw*. Use the rule of multiplication to determine the probability of producing an offspring with the genotype *Ffww*. *Show all work*. (3)

Bonus:
A tetrahybrid cross is performed between two individuals with the genotype AaBbCcDd.
What is the probability of producing a child with *at least three* recessive traits? *Attach all work.* (2) _____