**HOMOZYGOUS MONOHYBRID (1 gene) CROSS**

**R = round T = tall Y = yellow peas P = purple flowers  
 r = wrinkled t = short y = green peas p = white flowers**

**PURE-BREEDING YELLOW SEED parent X PURE-BREEDING GREEN SEED parent.**

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**POSSIBLE OFFSPRING**

**GENOTYPE PHENOTYPE**

**\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**What is the probability an offspring will show the DOMINANT TRAIT (YELLOW SEEDS)? \_\_\_\_\_\_\_\_  
What is the probability an offspring will show the RECESSIVE TRAIT (GREEN SEEDS)? \_\_\_\_\_\_\_\_  
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**HOMOZYGOUS PURPLE FLOWER parent X HOMOZYGOUS WHITE FLOWER parent.**

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**POSSIBLE OFFSPRING**

**GENOTYPE PHENOTYPE**

**\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   
  
What is the probability an offspring will show the DOMINANT TRAIT (PURPLE FLOWERS)? \_\_\_\_\_\_\_\_  
What is the probability an offspring will show the RECESSIVE TRAIT (WHITE FLOWERS)? \_\_\_\_\_\_\_\_**

**HOMOZYGOUS TALL plant X PURE-BREEDING SHORT plant.**

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**POSSIBLE OFFSPRING**

**GENOTYPE PHENOTYPE**

**\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**What is the probability an offspring will show the DOMINANT TRAIT (TALLNESS)? \_\_\_\_\_\_\_\_\_\_  
What is the probability an offspring will show the RECESSIVE TRAIT (SHORTNESS)? \_\_\_\_\_\_\_\_\_**

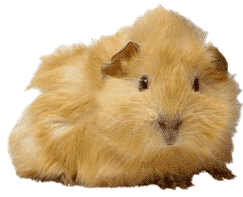
**SEE A PATTERN FOR HOMOZYGOUS MONOHYBRID CROSSES:**

**If you cross plants that are HOMOZYGOUS DOMINANT with plants that are HOMOZYGOUS RECESSIVE for a trait, \_\_\_\_\_\_\_\_ % of the offspring will show the DOMINANT trait and the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ trait will not show at all.**

**USE THE PATTERN ABOVE TO MAKE PREDICTION ABOUT A CROSS WITHOUT A PUNNETT**

**If you cross a HOMOZYGOUS ROUND SEED plant with a PURE-BREEDING WRINKLED SEED plant  
 100% will look \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 0% will look \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**The offspring will have a 100% probability of having the \_\_\_\_\_\_ genotype.**

**HETEROZYGOUS MONOHYBRID CROSSES**

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**A black coat (B) is DOMINANT in guinea pigs. A brown coat (b) is RECESSIVE.   
  
Make a cross between TWO HETEROZYGOUS BLACK guinea pigs.**

**POSSIBLE OFFSPRING**

**GENOTYPE PHENOTYPE**

**\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
 \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
 \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**What is the probability that an offspring will be black? \_\_\_\_\_\_\_\_\_   
What is the probability that an offspring will be brown? \_\_\_\_\_\_\_\_\_  
What is the probability that an offspring will be a HYBRID? \_\_\_\_\_\_\_\_  
What is the probability that an offspring will be HOMOZYGOUS DOMINANT ? \_\_\_\_\_\_\_\_\_  
What is the probability that an offspring will be HOMOZYGOUS RECESSIVE? \_\_\_\_\_\_\_\_\_\_\_  
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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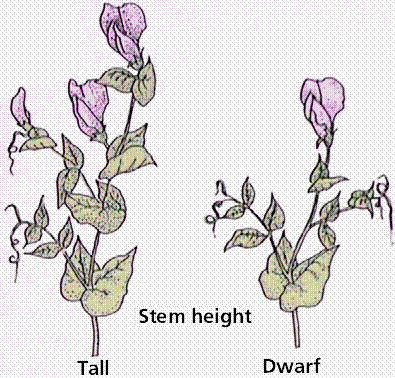
**Purple fur (P) is DOMINANT in monsters. Yellow fur (p) is RECESSIVE.   
  
Make a cross between TWO HETEROZYGOUS PURPLE MONSTERS.**

**POSSIBLE OFFSPRING**

**GENOTYPES PHENOTYPES**

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 \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
 \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**What is the probability that an offspring will be purple ? \_\_\_\_\_\_\_\_\_\_  
What is the probability that an offspring will be yellow? \_\_\_\_\_\_\_\_\_\_  
What is the probability that an offspring will be a heterozygous? \_\_\_\_\_\_\_\_\_  
What is the probability that an offspring will be HOMOZYGOUS DOMINANT ? \_\_\_\_\_\_\_\_\_  
What is the probability that an offspring will be HOMOZYGOUS RECESSIVE? \_\_\_\_\_\_\_\_\_\_\_**

**Tallness (T) is DOMINANT in pea plants. Shortness (t) is RECESSIVE.   
  
Make a cross between TWO HETEROZYGOUS TALL PEA PLANTS.**

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**POSSIBLE OFFSPRING**

**GENOTYPES PHENOTYPES**

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 \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
 \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**What is the probability that an offspring will be tall ? \_\_\_\_\_\_\_\_\_\_  
What is the probability that an offspring will be short? \_\_\_\_\_\_\_\_\_\_  
What is the probability that an offspring will be a heterozygous? \_\_\_\_\_\_\_\_\_  
What is the probability that an offspring will be HOMOZYGOUS DOMINANT ? \_\_\_\_\_\_\_\_\_  
What is the probability that an offspring will be HOMOZYGOUS RECESSIVE? \_\_\_\_\_\_\_\_\_\_\_  
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**SEE A PATTERN FOR HETEROZYGOUS MONOHYBRID CROSSES:**

**If you cross 2 parent plants that are BOTH HETEROZYGOUS for a trait   
the offspring will show a \_\_\_\_ : \_\_\_\_ phenotypic ratio (DOMINANT:RECESSIVE)  
\_\_\_\_\_\_\_\_ % of the offspring will show the DOMINANT trait and  
\_\_\_\_\_\_\_\_ % of the offspring will show the RECESSIVE trait.**

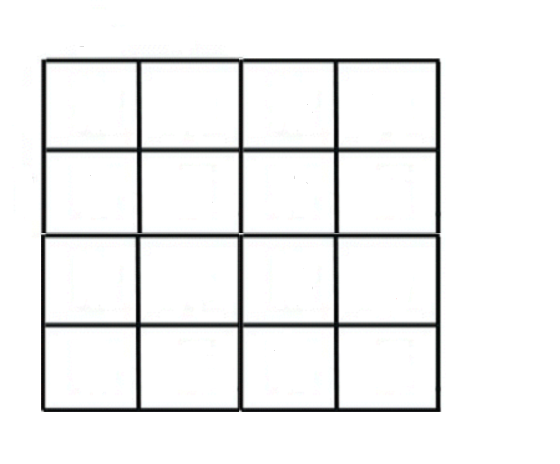
**USE DOMINANT OR RECESSIVE TO FILL IN THE BLANKS BELOW:  
¼ of the offspring will have two \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ alleles,   
½ will be hybrids with one \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and one \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ allele, and   
¼ will have two \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ alleles.**

**USE THE PATTERN ABOVE TO MAKE PREDICTION ABOUT A CROSS  
If you cross two HETEROZYGOUS ROUND SEED plants   
 75% will LOOK \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 25% will LOOK \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
The probability is:  
¼ will have the genotype \_\_\_\_\_\_ ½ will have the genotype \_\_\_\_\_ ¼ will have the genotype \_\_\_\_\_**

**MAKING HOMOZYGOUS TWO GENE CROSSES:   
HOMOZYGOUS ROUND & YELLOW X PURE-BREEDING WRINKLED & GREEN**

**Parent genotype \_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_**

**Possible gametes \_\_\_\_ \_\_\_\_ \_\_\_\_ \_\_\_\_ \_\_\_\_ \_\_\_\_ \_\_\_\_ \_\_\_\_**

 **How many out of 16 will be ?**

**\_\_\_\_\_ ROUND & YELLOW**

**\_\_\_\_\_ WRINKLED & YELLOW**

**\_\_\_\_\_ ROUND & GREEN**

**\_\_\_\_\_ WRINKLED & GREEN**

**SEE A PATTERN FOR HOMOZYGOUS TWO GENE CROSSES:**

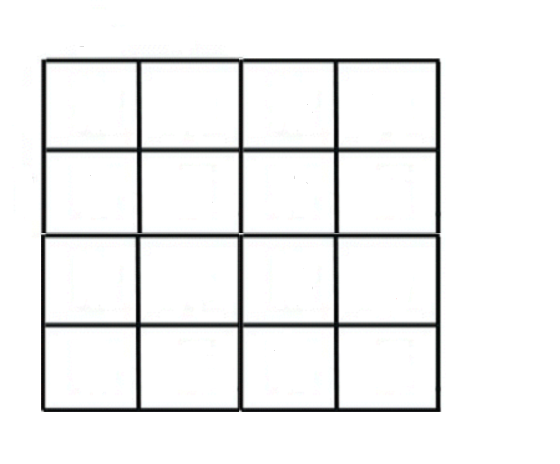
**If you cross plants that are PURE DOMINANT for TWO TRAITS with plants that are PURE RECESSIVE for TWO TRAITS, \_\_\_\_\_\_\_\_ % of the offspring will look DOMINANT for BOTH traits and the TWO \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ traits will not show at all.**

**USE THE PATTERN ABOVE TO MAKE PREDICTION ABOUT A CROSS  
If you cross a HOMOZYGOUS PURPLE TALL parent with a HOMOZYGOUS WHITE SHORT parent.   
 100% of the offspring will LOOK \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_ and  
 ALL will have the GENOTYPE \_\_\_\_\_\_\_\_\_\_\_**

**HETEROZYGOUS DIHYBRID CROSSES  
make a cross between two HETEROZYGOUS ROUND & YELLOW parents.**

**Parent genotype \_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_**

**Possible gametes \_\_\_\_ \_\_\_\_ \_\_\_\_ \_\_\_\_ \_\_\_\_ \_\_\_\_ \_\_\_\_ \_\_\_\_**

**WHAT IS THE PROBABILITY AN   
 OFFSPRING WILL BE ?**

**\_\_\_\_\_ ROUND & YELLOW**

**\_\_\_\_\_ WRINKLED & YELLOW**

**\_\_\_\_\_ ROUND & GREEN**

**\_\_\_\_\_ WRINKLED & GREEN**

**\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ TRAIT 1 ; \_\_\_\_\_\_\_\_\_\_\_\_\_ TRAIT 2**

**\_­­­­\_­­­\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ TRAIT 1; \_\_\_\_\_\_\_\_\_\_\_\_\_ TRAIT 2**

**\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ TRAIT 1; \_\_\_\_\_\_\_\_\_\_\_\_\_ TRAIT 2**

**\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ TRAIT 1; \_\_\_\_\_\_\_\_\_\_\_\_\_ TRAIT 2**

**\_\_\_\_\_\_\_\_\_\_\_\_ ratio is a clue that it’s a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_cross**

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**USE THE PATTERN TO MAKE A CROSS WITHOUT A PUNNETT  
CROSS TWO HETEROZYGOUS ROUND & PURPLE parents**

**The probability is :  
9/16 will be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ & \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
3/16 will be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ & \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
3/16 will be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ & \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
1/16 will be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ & \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**INCOMPLETE DOMINANCE:**

**In Four O’Clock plants RED FLOWERS (R) are INCOMPLETELY DOMINANT over white (W)   
flowers. Heterozygous plants show a BLENDED INTERMEDIATE phenotype of PINK flowers.**

**MAKE A CROSS WITH 2 HETEROZYGOUS FOUR O’CLOCK PLANTS.**

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**POSSIBLE OFFSPRING**

**PROBABILITY GENOTYPE PHENOTYPE**

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 \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   
 \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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**CODOMINANCE  
  
In chickens, alleles for BLACK (B) and WHITE (W) color are CODOMINANT.   
  
Heterozygous chickens show a black and white speckled (ERMINETTE) phenotype.**

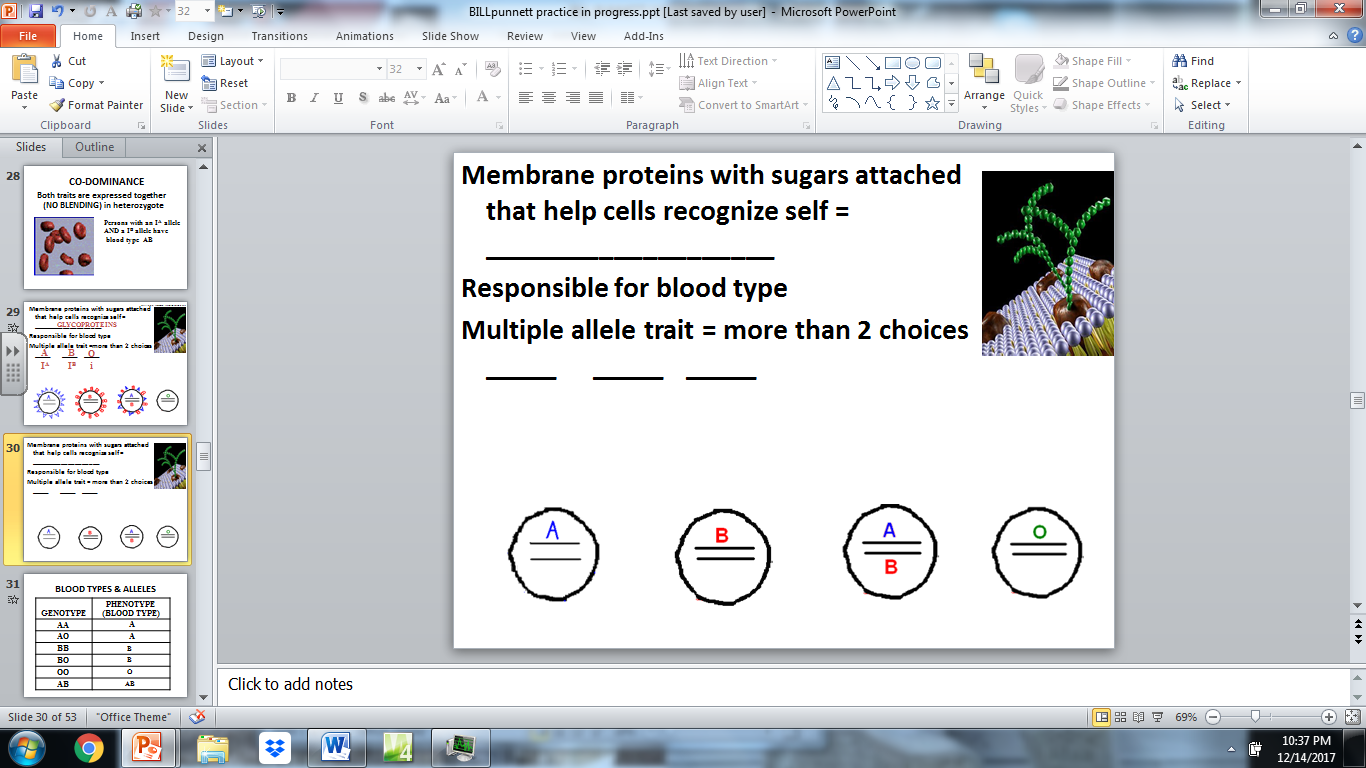
**MAKE A CROSS WITH 2 HETEROZYGOUS ERMINETTE chickens.**

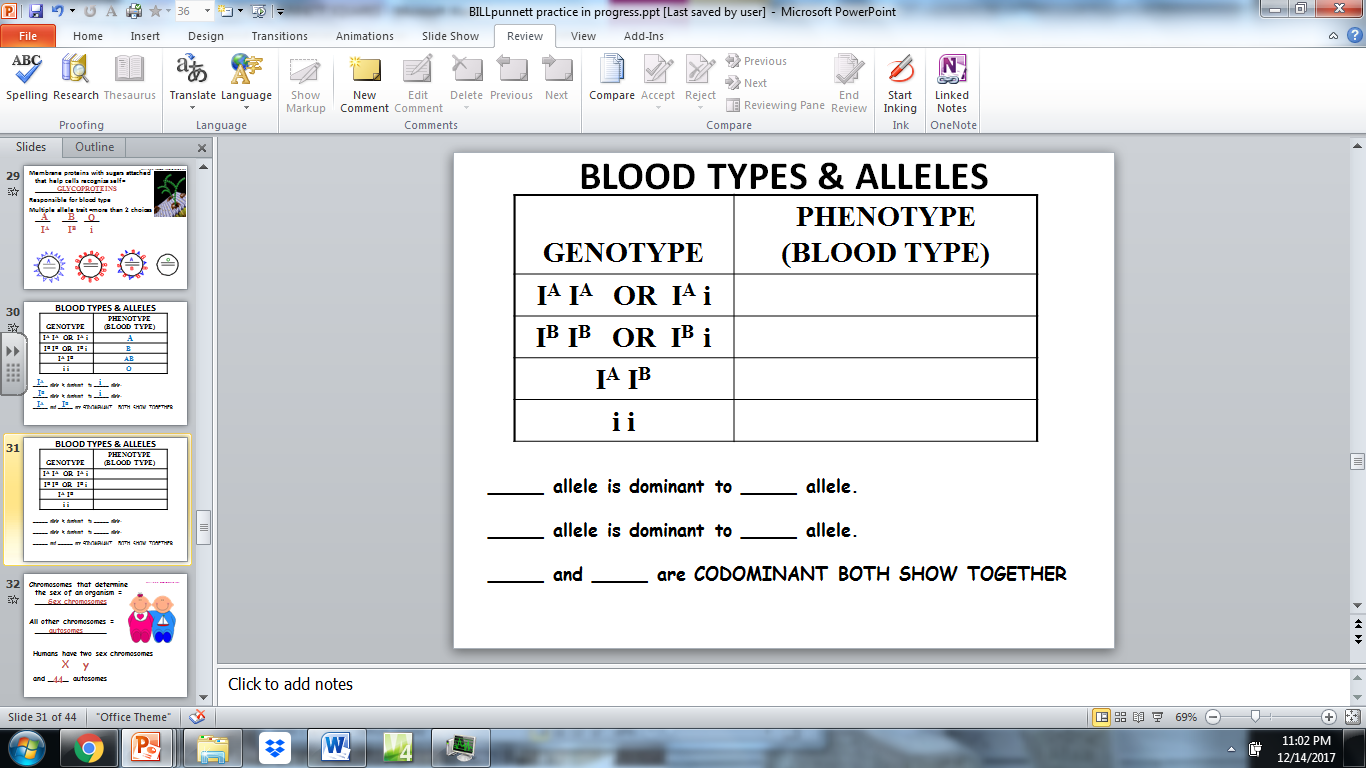
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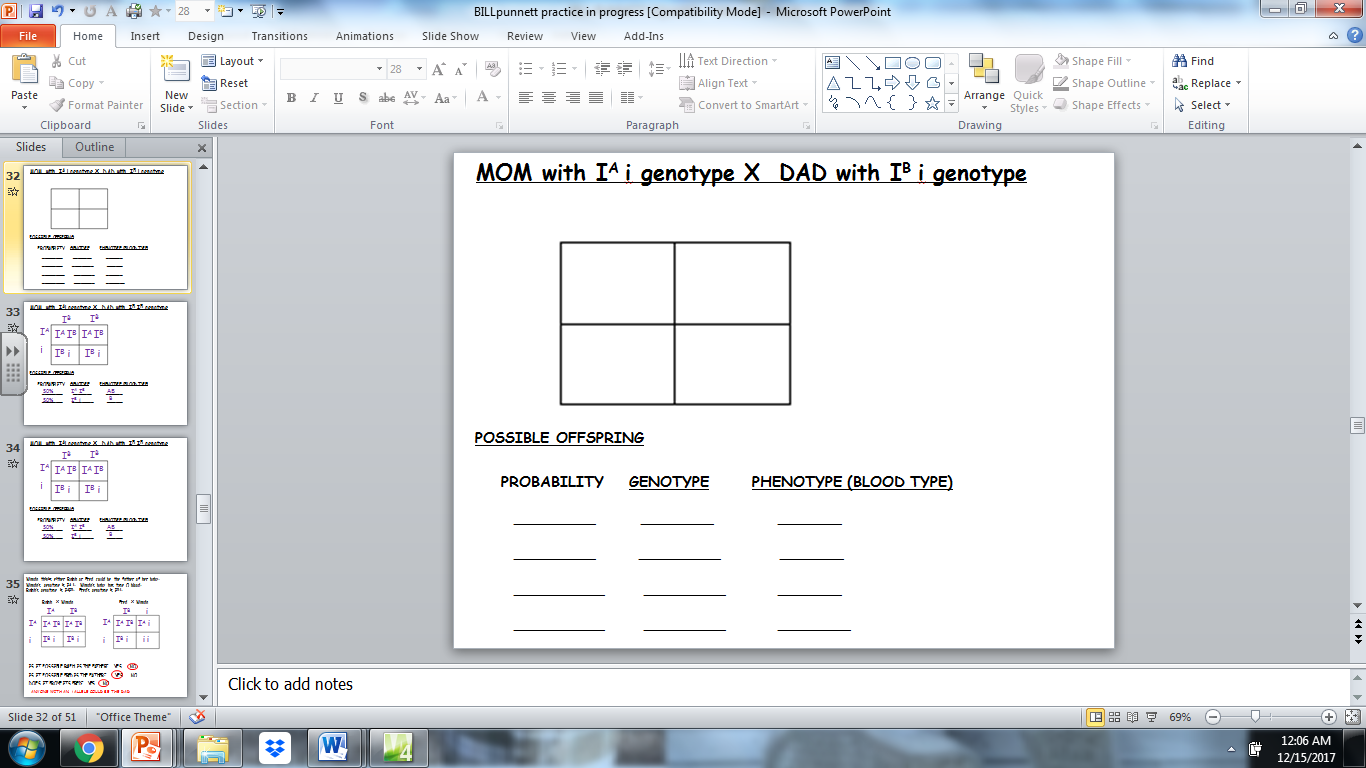
**POSSIBLE OFFSPRING**

**PROBABILITY GENOTYPE PHENOTYPE**

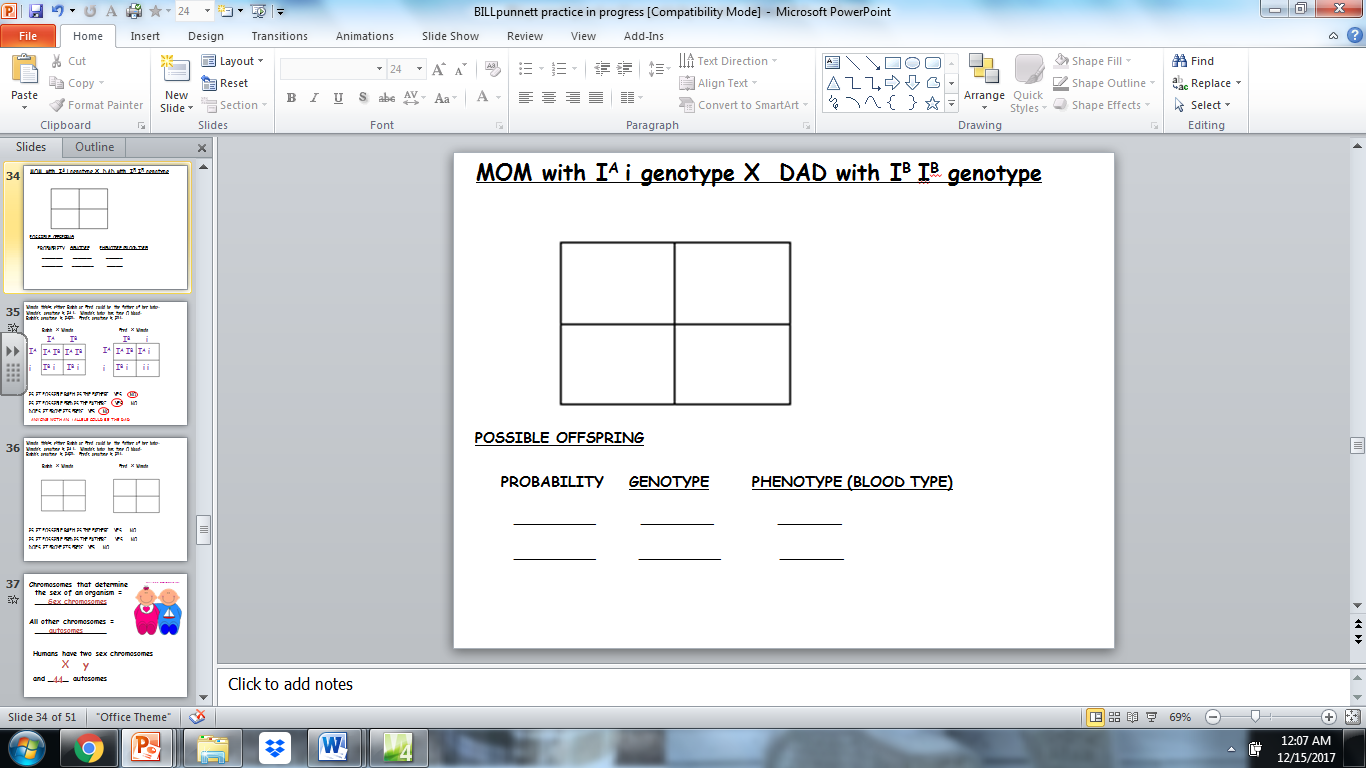
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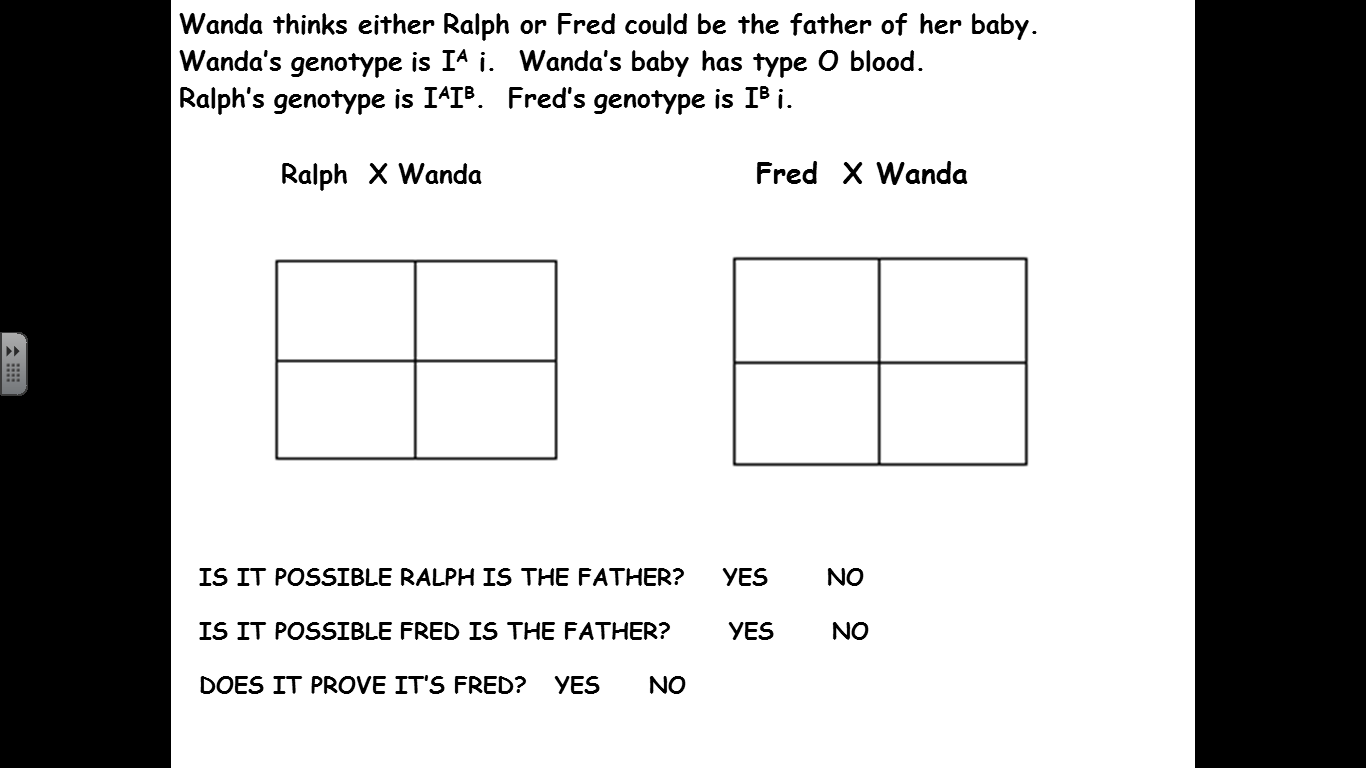


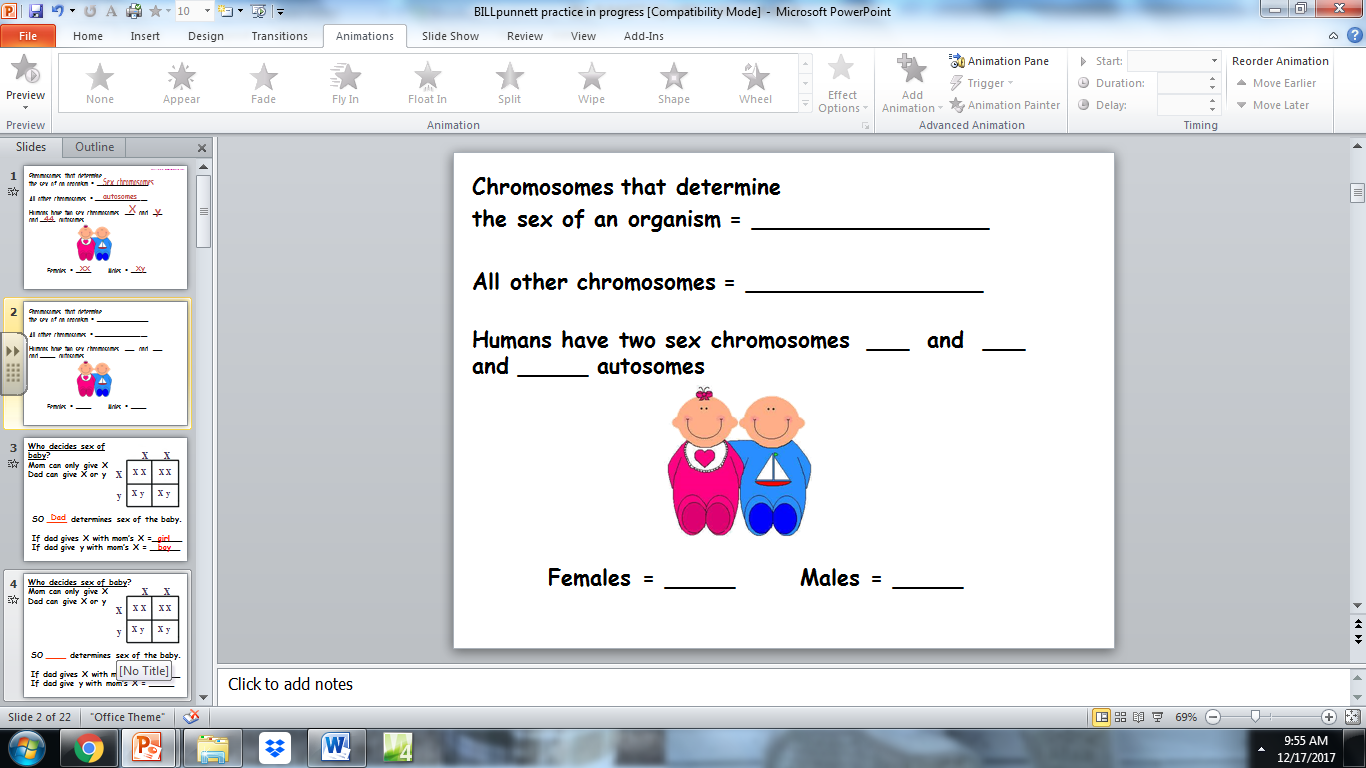


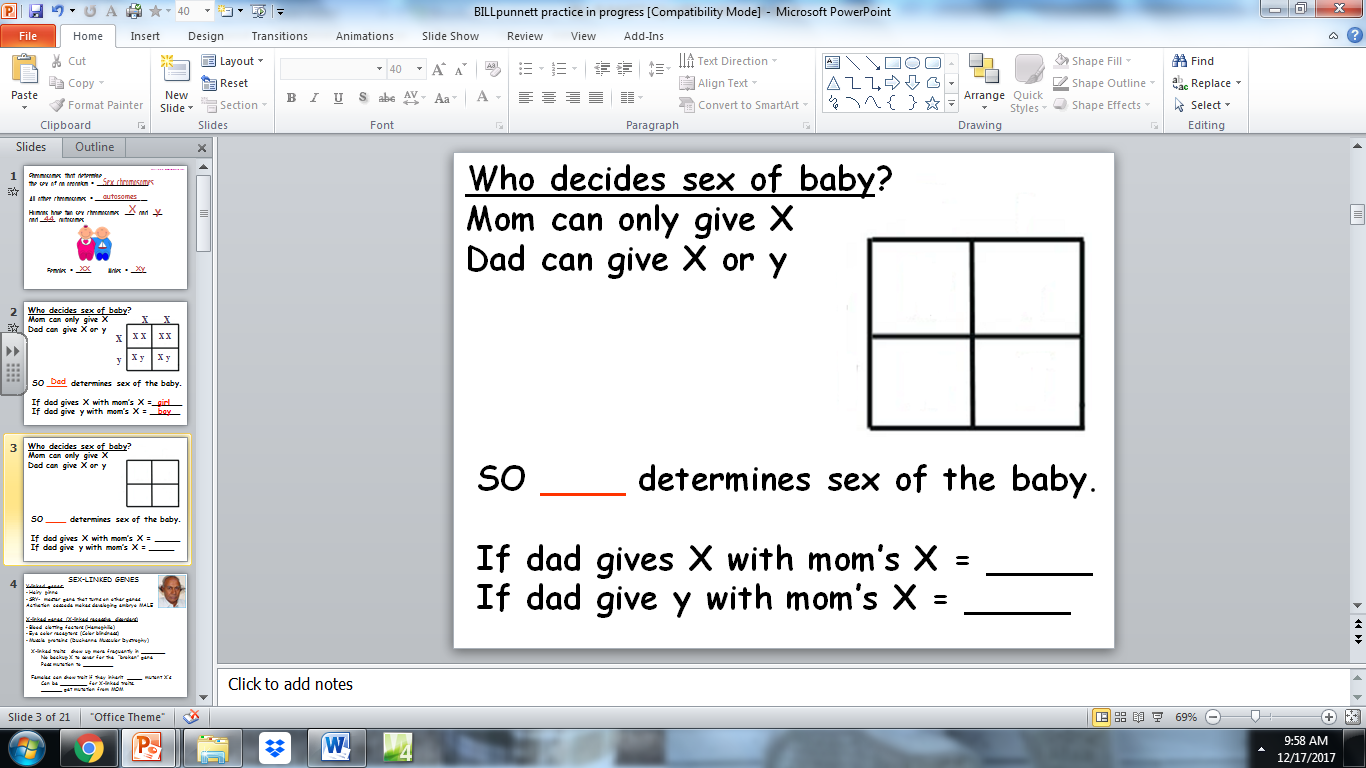


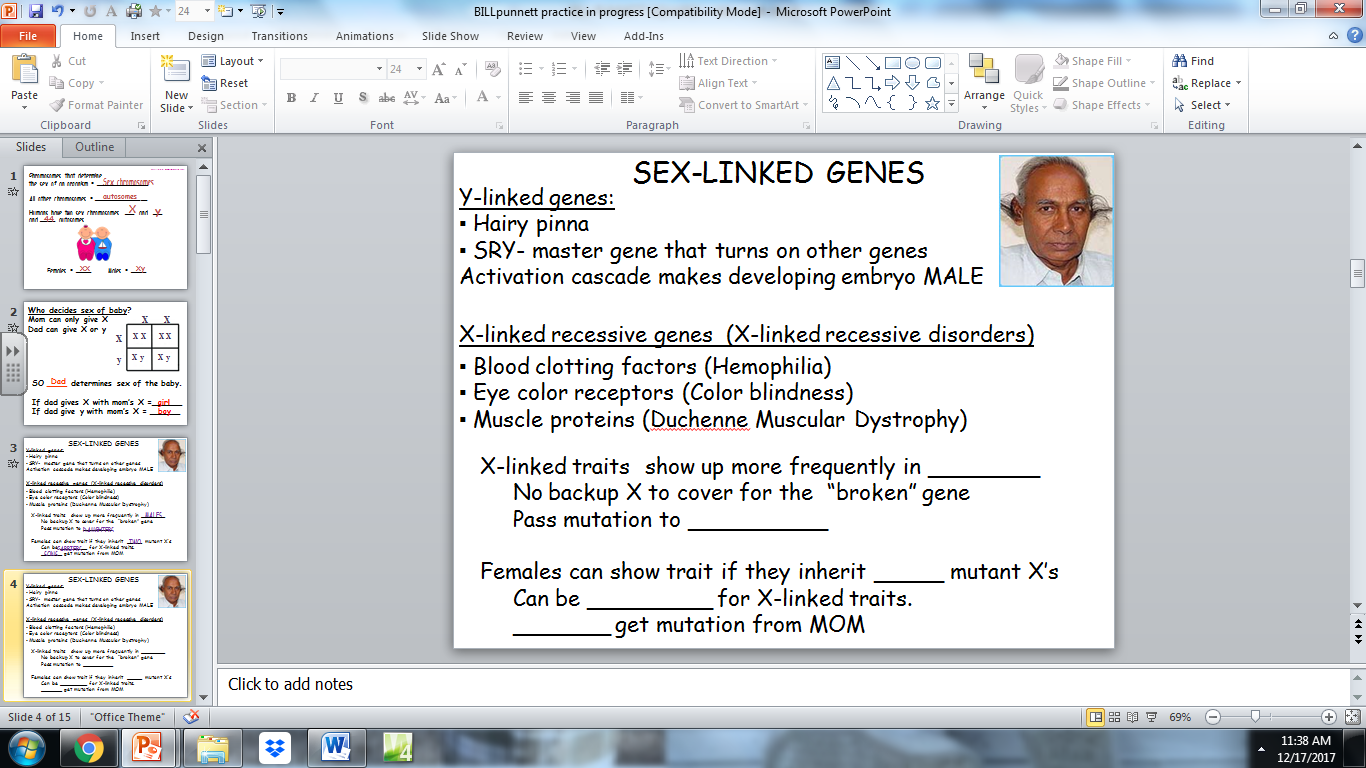
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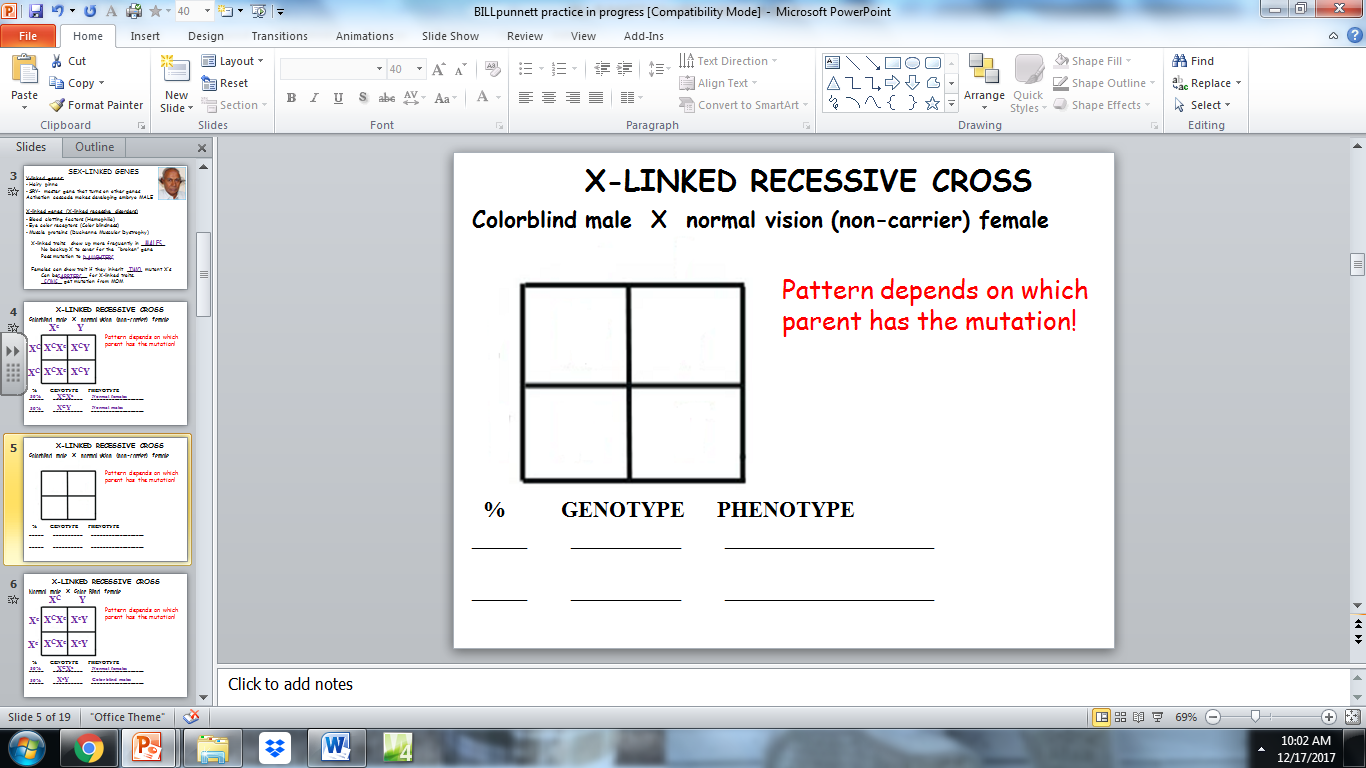


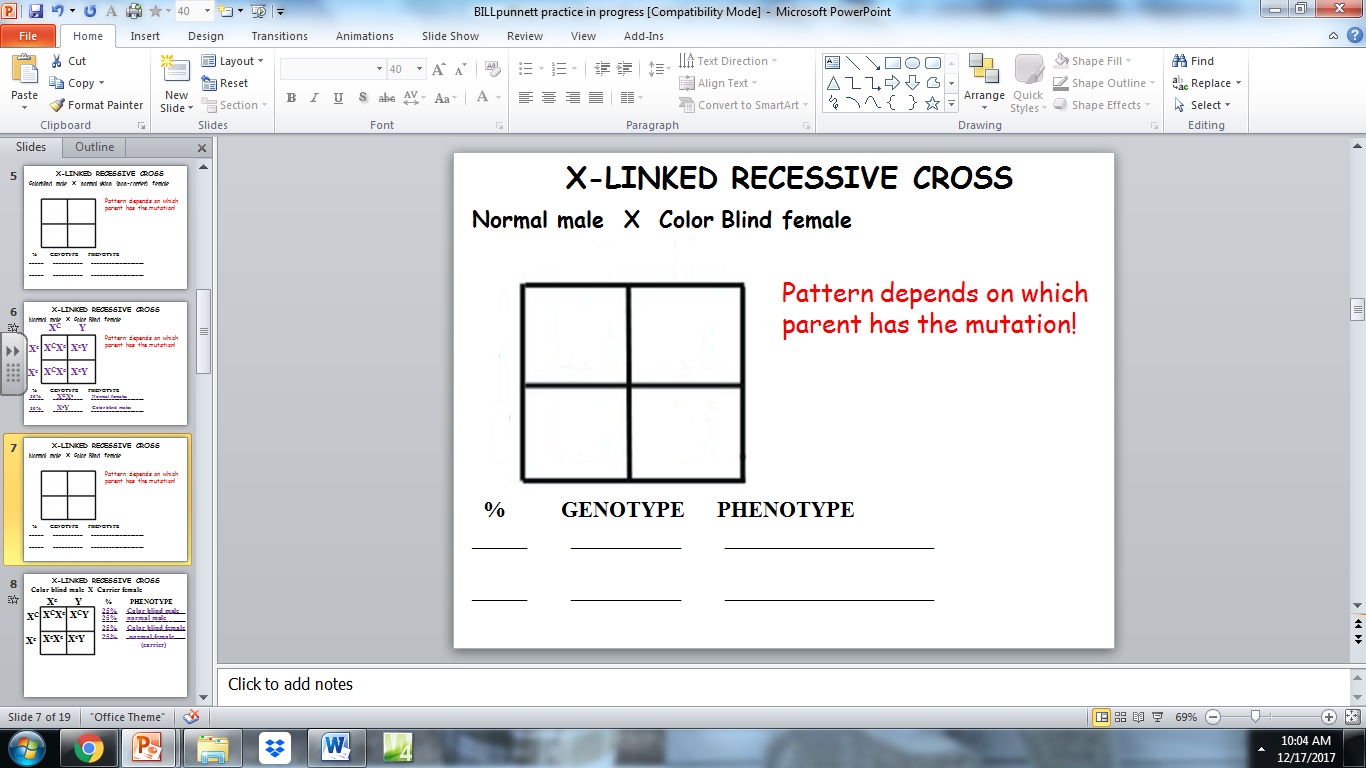


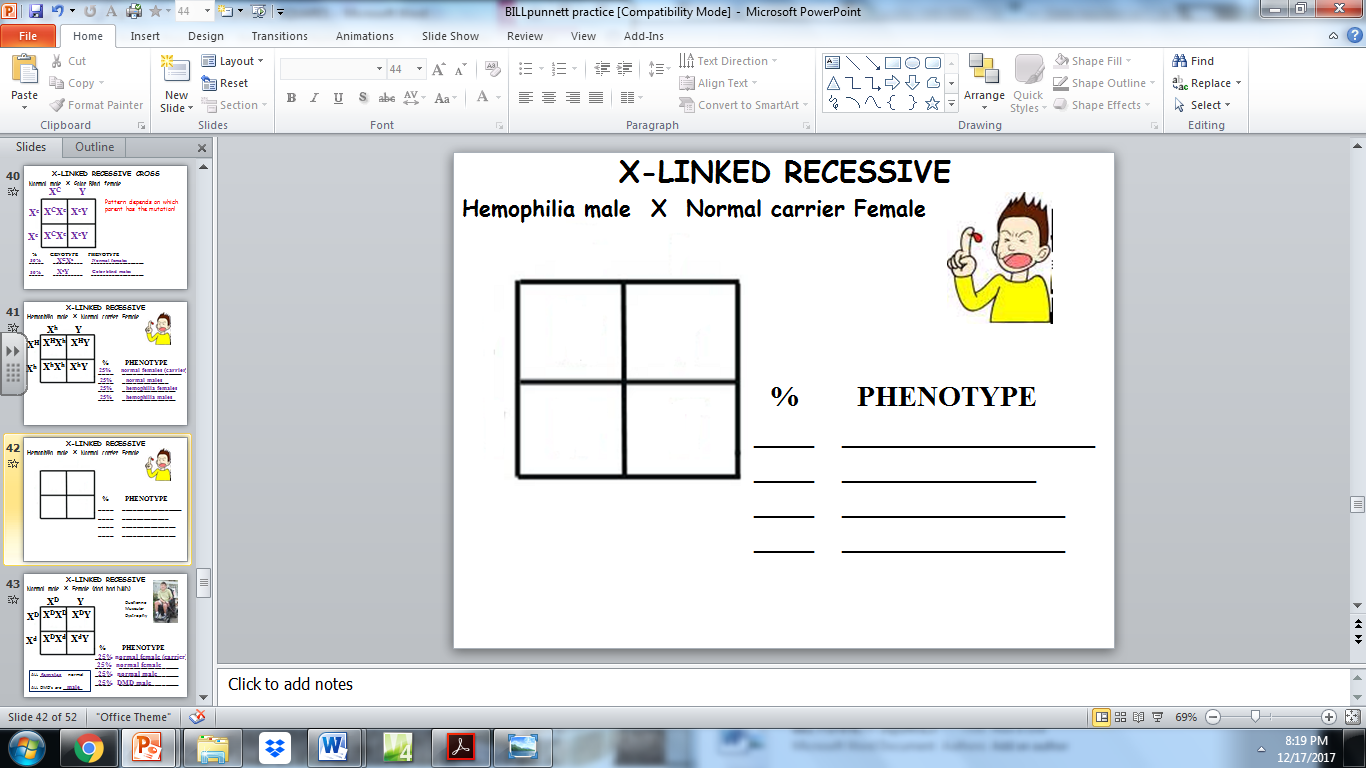




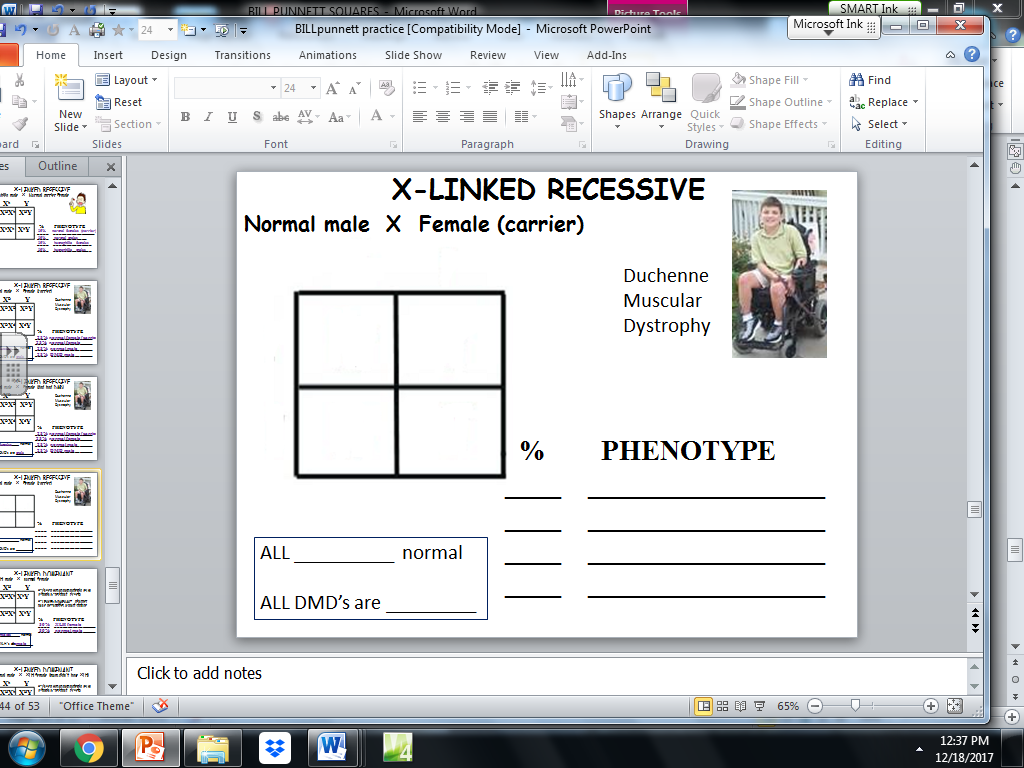
**SEX-LINKED GENES-Patterns different in males vs females**

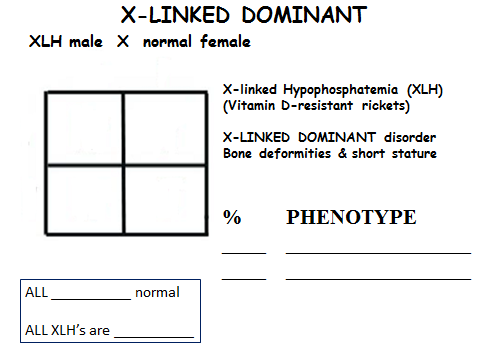


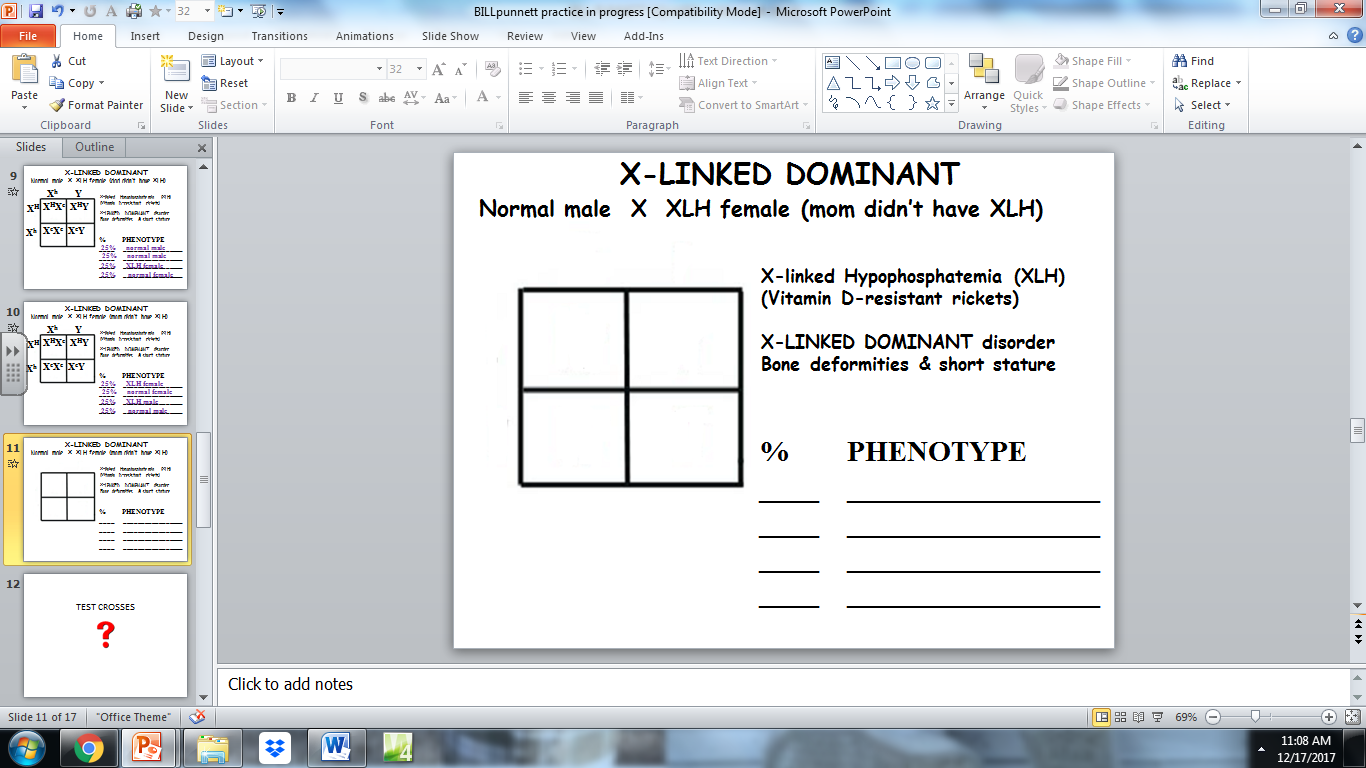
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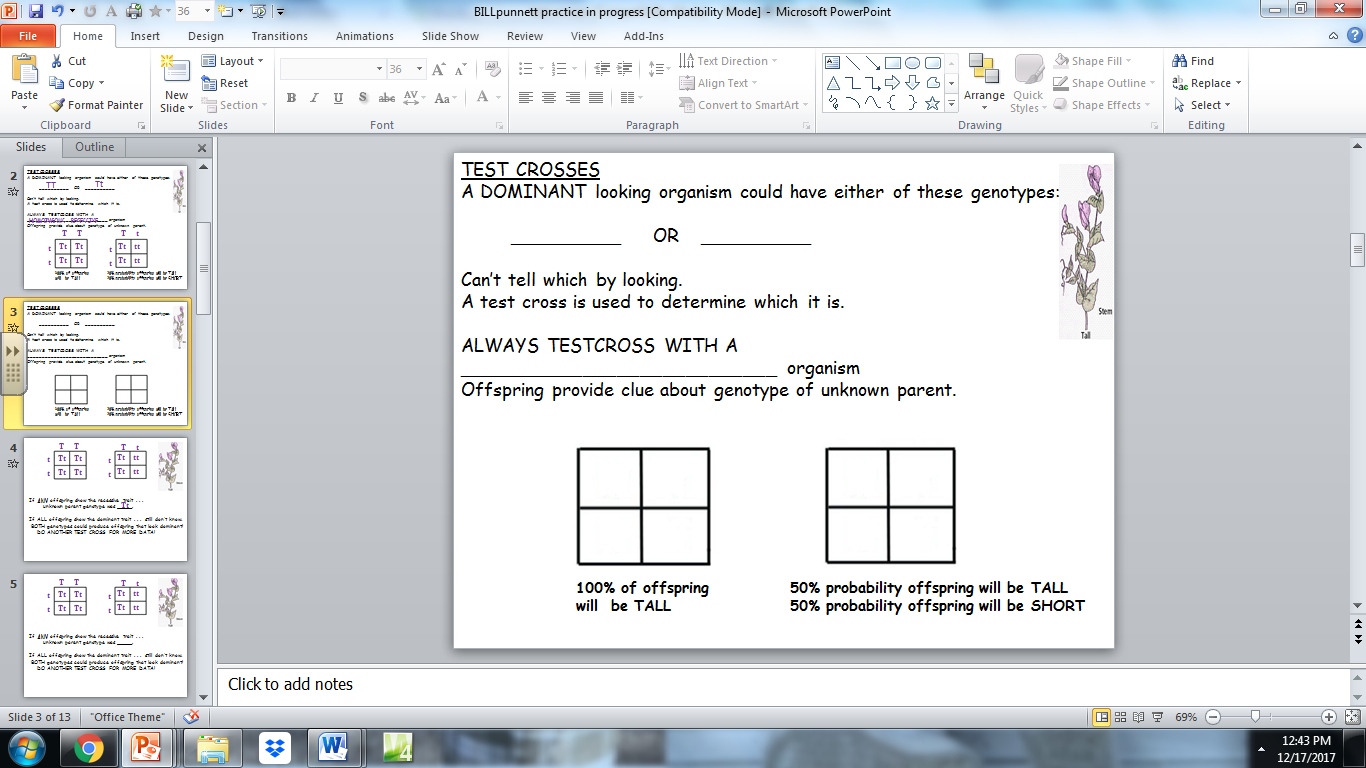
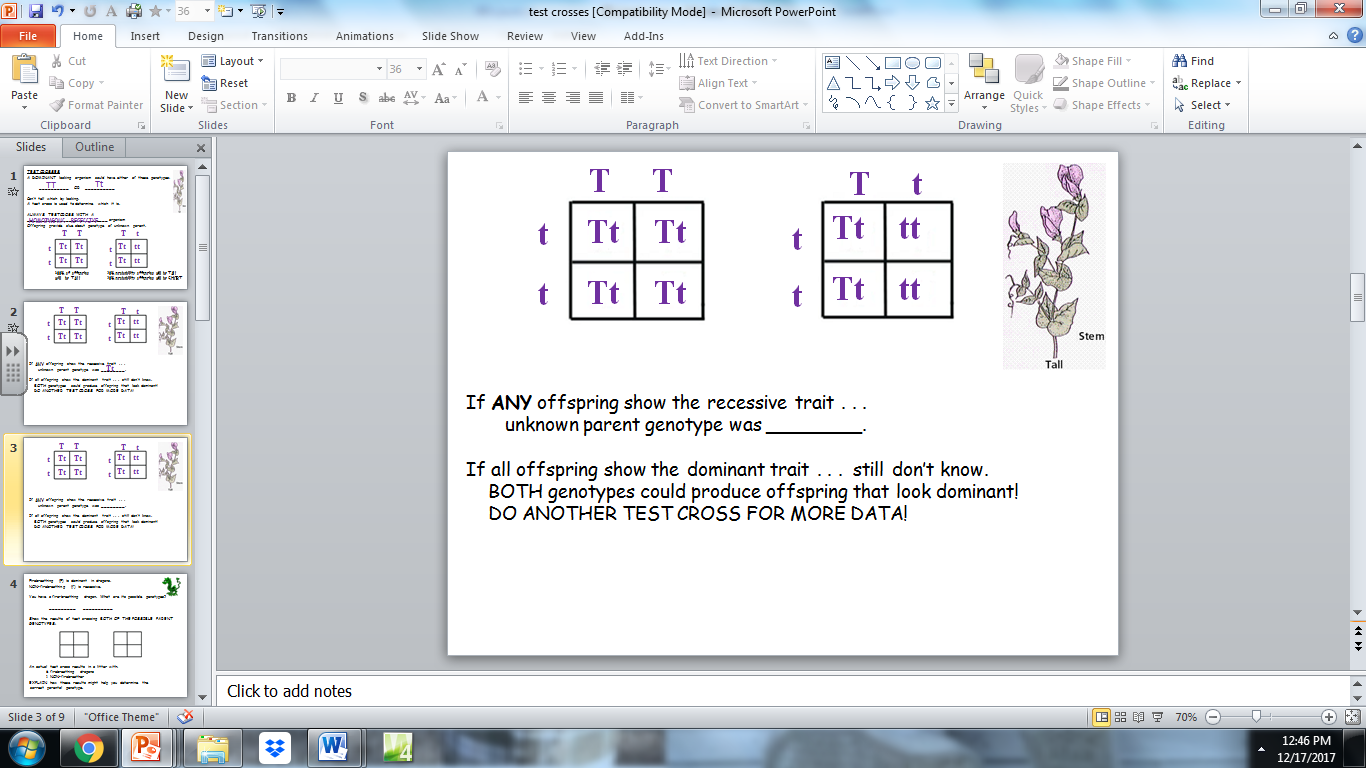


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TEST CROSS PRACTICE:  
Firebreathing (F) is dominant in dragons.   
NON-firebreathing (f) is recessive.

You have a fire-breathing dragon.  
 What are its possible genotypes? \_\_\_\_\_\_\_\_ OR \_\_\_\_\_\_\_\_

Show the results of test crossing BOTH of the possible parent genotypes:

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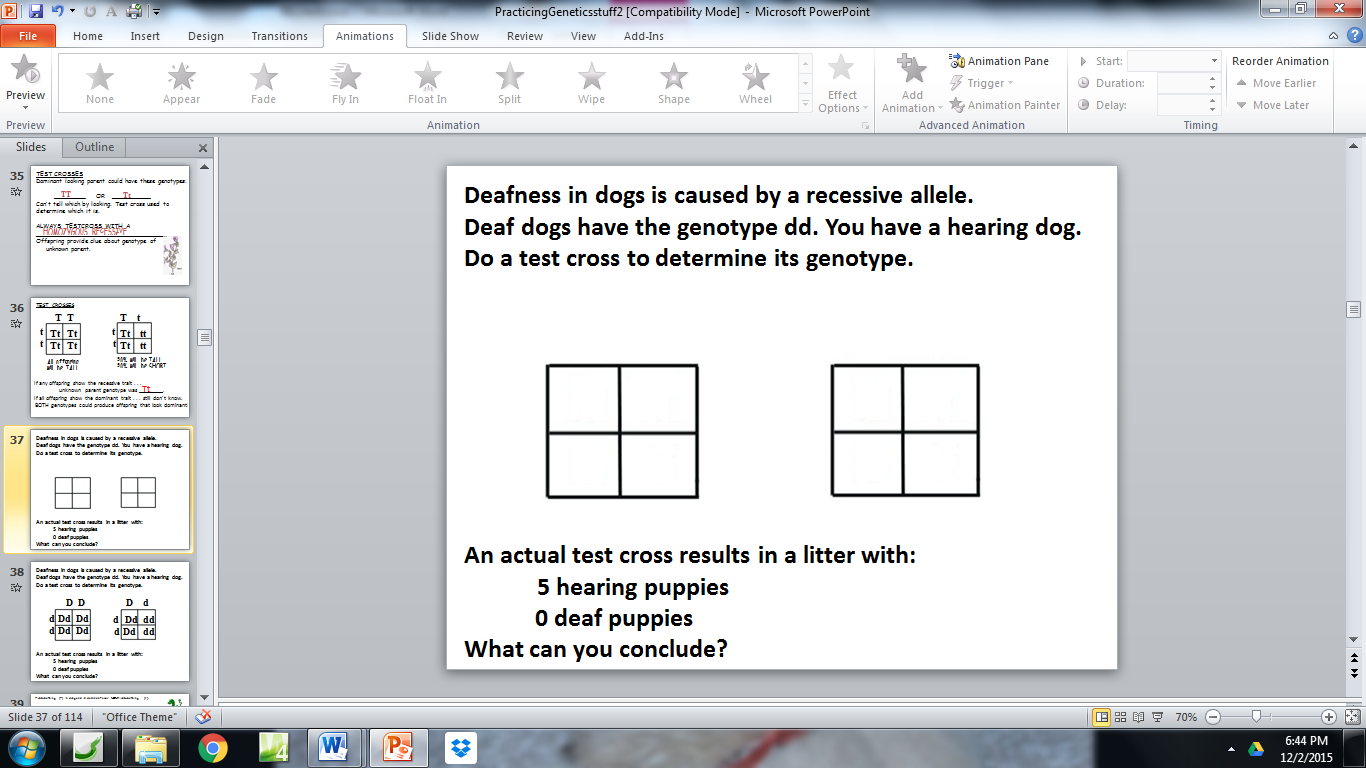
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An actual test cross results in a litter with:

6 firebreathing dragons   
 2 NON-firebreathers

What can you conclude about the unknown parent’s genotype?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
  
Deafness in dogs is caused by a recessive allele.  
  
Deaf dogs have the genotype dd. You have a hearing dog.   
  
What are its possible genotypes? \_\_\_\_\_\_\_\_ OR \_\_\_\_\_\_\_  
  
Show the possibilities of a test cross to determine its genotype.



An actual test cross results in a litter with:  
 5 hearing puppies  
 0 deaf puppies  
What can you conclude about the unknown parent’s genotype?