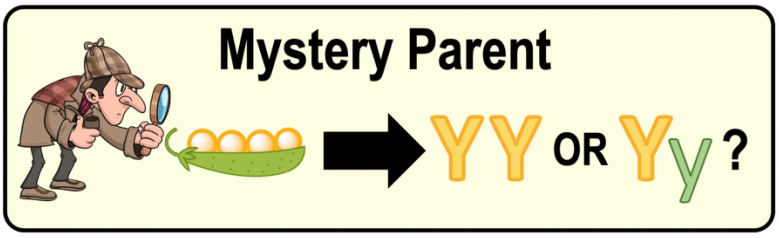
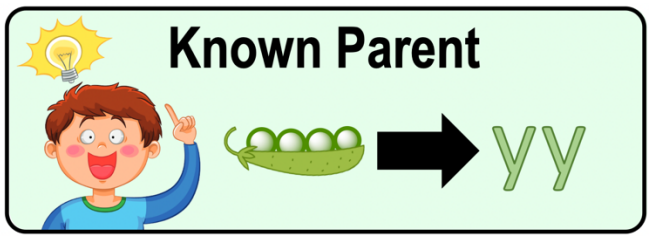
CONCEPT: TEST CROSSES

●Phenotypes do _____ always reveal the genotype (ex. Yellow pea could be YY or Yy).

□ Scientists use _____ **crosses** to test/identify the genotype of an unknown (*mystery*) parent.

●*Mystery* parent's genotype is identified by _____-fertilization with "known" *homozygous recessive* genotype.





Steps to Performing a Test Cross

Step 1: Cross the "mystery" parent (unknown genotype) with a homozygous _____ parent.

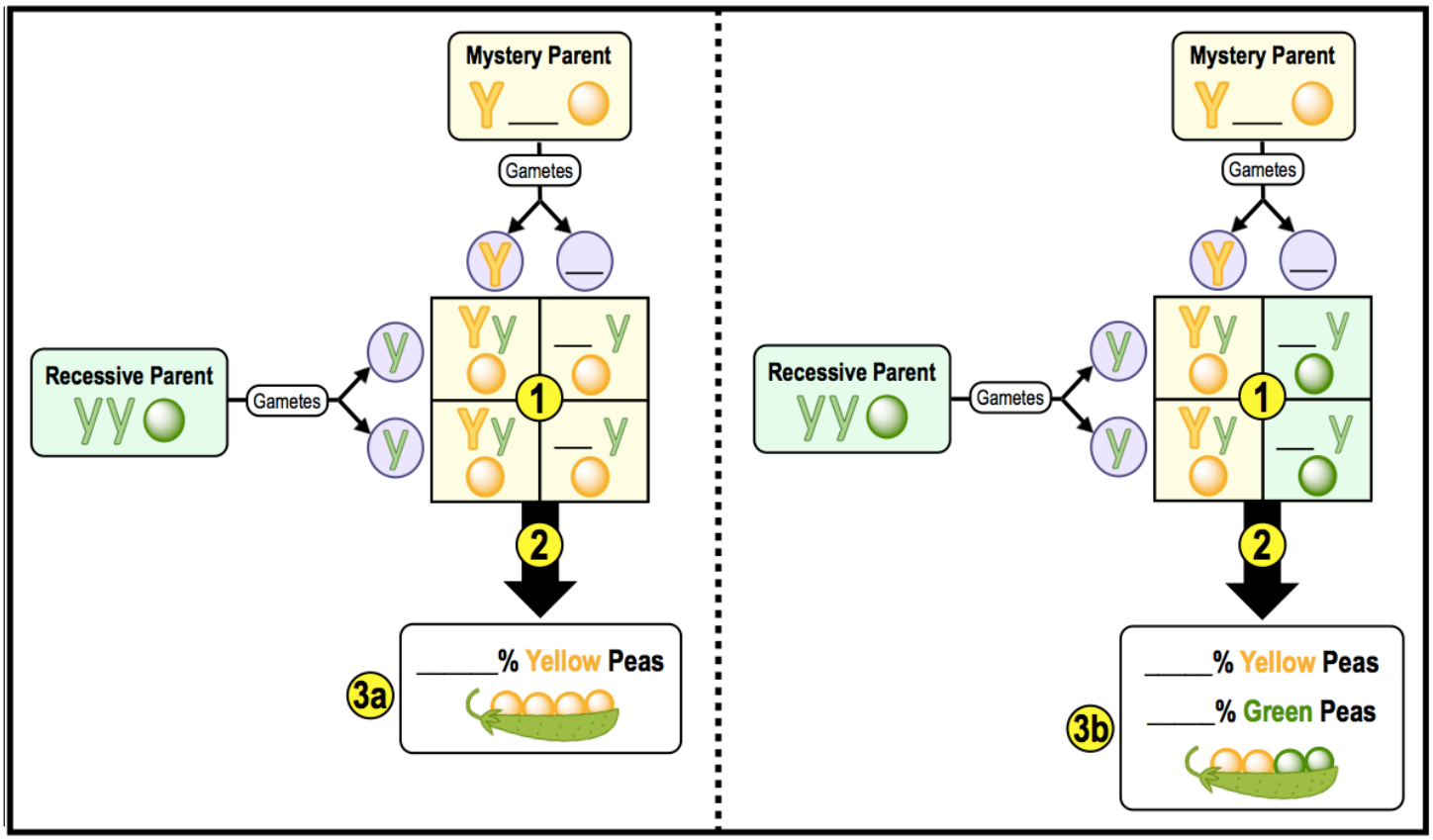
Step 2: Analyze the "_____" or offspring phenotypes.

Step 3: Make a conclusion about *mystery* parent's _____ based on *results*.

3a All *dominant* offspring: *mystery* genotype = Y____.

3b *Mixed* offspring: *mystery* genotype = Y____.

EXAMPLE: Test Cross to Determine the Genotype of a Yellow Pea.



CONCEPT: TEST CROSSES

PRACTICE: To identify the genotype of a yellow-seeded pea plant as either homozygous dominant (YY) or heterozygous (Yy), you could do a test cross between your mystery plant and a plant with a genotype of _____.

a) YY. b) yY. c) Yy. d) yy.

PRACTICE: A single gene test cross is conducted to determine the genotype of a pea plant that shows the dominant phenotype for height (T = tall, t = short). If all offspring of the cross show the dominant phenotype, then the genotype of the unknown parent is _____.

a) TT. b) tY. c) Tt. d) tt.

PRACTICE: You want to determine the pea color genotype of a pea plant with yellow peas. You conduct a test cross with your mystery pea plant. The test cross results in 50% of the offspring possessing yellow peas and 50% of the offspring possessing green peas. What is the genotype for pea color of the mystery parent?

a) YY.
b) Yy.
c) yy.
d) None of the above.