Using Genetics to Help Solve Mysteries

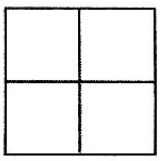
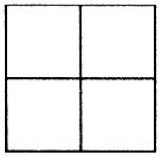
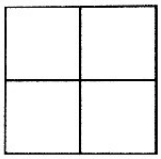
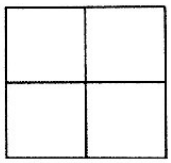
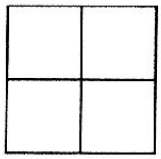
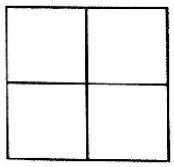
ABO blood type in humans is determined by three alleles: I^A, I^B, and i. I^A and I^B are codominant alleles. Both I^A and I^B are dominant to the allele i. Four possible phenotypes or ABO blood types, A, B, AB, and O, are possible when these alleles are combined. The gentotypes and phenotypes for each blood type are summarized in the table at the right.

Genotype	Blood type
$I^A\ I^A$	A
$I^A\ i$	A
$I^B\ I^B$	B
$I^B\ i$	B
$I^A\ I^B$	AB
ii	O

Using this information, give a possible solution for the following problem.

Problem: Four newborn babies in the delivery room of the hospital at the same time were mixed up by the nurse who attached the wristbands. The blood types of the four babies were known to be AB, O, A, and B. How did the doctors find out which baby belongs to which set of parents? Parents #1 had blood types O and AB; Parents #2 had blood types AB and B; Parents #3 both had blood type O; Parents #4 had blood types O and A.

Possible Solution: Use Punnett squares to determine possible genotypes of offspring. Then write the parents of each baby.

1. Baby with type AB blood

2. Baby with type B blood

3. Baby with type A blood

4. Baby with type O blood