

Genotypes and Phenotypes in Blood **KEY**

- 1) The following table shows the blood type of mothers and children (lots of different families are shown). Please complete at a minimum **half** of the following table being sure to list **all** possibilities in each box. Once you have listed **possible** genotypes for the mother and child, list possible blood types and genotypes for the father, then **impossible** genotypes for the father (genotypes that can be eliminated as possibilities). As extra practice you may also wish to list the impossible father's blood type.

Mother Blood Type	Mother Possible Genotypes	Child Blood Type	Child Possible Genotypes	Father Possible Blood Type and Genotypes	Father Impossible Genotypes	Father Impossible Blood Type
A	AA or AO	O	OO only	A or B (AO or BO)	AB, AA, BB	AB
B	BB or BO	AB	AB only	A, AB (AA, AO or AB)	BB, BO, OO	B or O
O	OO only	A	AA or AO (only AO since Mom is O)	A, AB (AA, AO or AB)	BB, BO, OO	B or O
AB	AB only	A	AA or AO	A, B, O (AA, AO, BO, OO)	BB	None, all are possible
O	OO only	O	OO only	A, B, or O (AO, BO, OO)	AA, BB, AB	AB
B	BB or BO	B	BB or BO	A, B, AB, O (AO, BB, BO, AB, OO)	AA	None, all are possible

Mother Blood Type	Mother Possible Genotypes	Child Blood Type	Child Possible Genotypes	Father Possible Blood Type and Genotypes	Father Impossible Genotypes	Father Impossible Blood Type
AB	AB only	AB	AB only	A, B, AB (AA, AO, BB, BO, AB)	OO	O
A	AA or AO	AB	AB only	B, AB (BB, BO or AB)	AA, AO, OO	A or O
B	BB or BO (only BO since child is A)	A	AA or AO (only AO since mom is B)	A or AB (AA, AO, AB)	BB, BO, OO	B or O
AB	AB only	B	BB or BO	A, B or O (BB, BO, AO, OO)	AA	none

Use the space below to show a minimum of three Punnett squares for your responses listed in the table above

- 2) People's Court: A Paternity Test. Mr and Mrs Jones had a baby boy named Skippy. The Jones' neighbor, Mr. King claimed he was the father of Skippy. Blood tests were conducted with the following results:

Person	Blood Type	Possible Genotypes
Skippy	O	
Mrs. Jones	B	
Mr. Jones	AB	
Mr. King	A	

- a) You are the judge (wow, law school went quick!). How would you rule? Please explain your answer clearly.
- b) How would your ruling change if Skippy's blood type was AB, instead of O? Please explain your answer clearly.
- 3) If you can't make a determination in either case, what do you suggest happen next? Be sure your answer relates to forensic chemistry class. In other words, what other tests might you recommend?