Blood Types WS **Name** _____

I can:
Determine the probability of blood types of offspring using genotype or phenotype of parents.

Use the information below to answer the following questions.

Human blood types are determined by genes that follow the CODOMINANCE pattern of inheritance. There are two dominant alleles (I^A and I^B) and one recessive allele (i).

Blood Type (Phenotype)	Genotype	Can donate blood to:	Can receive blood from:
O	ii	A,B,AB and O (universal donor)	O
AB	I^AI^B	O, AB	A,B,AB and O (universal receiver)
A	I^AI^A or I^Ai	AB, A	O,A
B	I^BI^B or I^Bi	AB,B	O,B

1. Write the genotype for each person based on the description:

   a. Homozygous for the "B" allele _____
   b. Heterozygous for the "A" allele _____
   c. Type O _____
   d. Type "A" and had a type "O" parent _____
   e. Type "AB" _____
   f. Blood can be donated to anybody _____
   g. Can only get blood from a type "O" donor _____

2. Pretend that dad is homozygous for the type B allele, and mom is type "O." **What are all the possible blood types of their baby?**

3. Draw a Punnett square showing all the possible blood types for the offspring produced by a type "O" mother and an a type "AB" father

4. Mrs. Clink is type “A” and Mr. Clink is type “O.” They have three children named Matthew, Mark, and Luke. Mark is type “O,” Matthew is type “A,” and Luke is type “AB.” Based on this information:
    a. Mr. Clink must have the genotype _____
    b. Mrs. Clink must have the genotype _____ because _____ has blood type _____
    c. Luke cannot be the child of these parents because neither parent has the allele _____.

5. Two parents think their baby was switched at the hospital. It’s 1968, so DNA fingerprinting technology does not exist yet. The mother has blood type “O,” the father has blood type “AB,” and the baby has blood type “B.”
    a. Mother’s genotype: _____
    b. Father’s genotype: _____
    c. Baby’s genotype: _____ or _____
    d. Punnett square showing all possible genotypes for children produced by this couple

    e. Was the baby switched?_____

6. Two other parents think their baby was switched at the hospital. The mother has blood type “A,” the father has blood type “B,” and the baby has blood type “AB.”
    a. Mother’s genotype: _____ or _____
    b. Father’s genotype: _____ or _____
    c. Baby’s genotype: _____
    d. Punnett square that shows the baby’s genotype as a possibility:

    e. Was the baby switched?_____

7. Based on the information in this table, which man **could not** be the father of the baby? Justify your answer with a Punnett square.

Name	Blood Type
Mother	Type A
Baby	Type B
Sammy the player	Type O
George the sleeze	Type AB
The milk man	Type A
The cable guy	Type B

8. Explain why blood type data cannot prove who the father of a baby <u>is</u>, and can only prove who the father <u>is not</u>.