Amoeba Sisters Video Recap: ***Multiple Alleles (ABO Blood Types) and Punnett Squares***

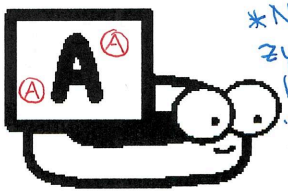
For the following boxes, fill in the below information regarding each blood type.

Blood Type A

1. **Phenotype:** Type A

2. Possible **Genotype**(s): I^AI^A; I^Ai
   (homozygote; heterozygote)

3. If the A type red blood cell below has any blood type **antigens** on its surface, please draw them below and label. If not, leave blank.



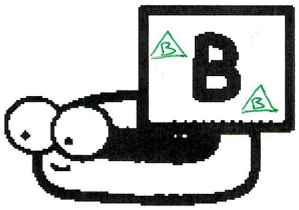
*Note: heterozygote would have fewer "A" antigens.

Blood Type B

4. **Phenotype:** Type B

5. Possible **Genotype**(s): I^BI^B; I^Bi
   (homozygote; heterozygote)

6. If the B type red blood cell below has any blood type **antigens** on its surface, please draw them below and label. If not, leave blank.



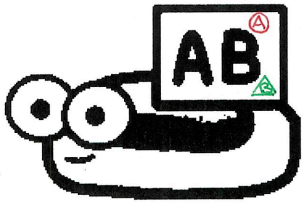
*Note: heterozygote would have fewer "B" antigens.

Blood Type AB

7. **Phenotype:** Type AB

8. Possible **Genotype**(s): I^AI^B

9. If the AB type red blood cell below has any blood type **antigens** on its surface, please draw them below and label. If not, leave blank.

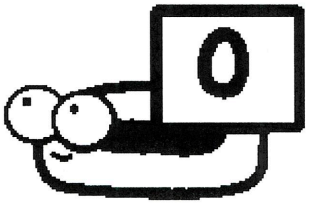


Blood Type O

10. **Phenotype:** Type O

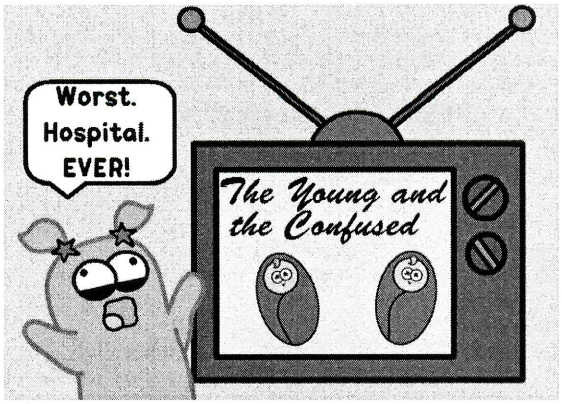
11. Possible **Genotype**(s): ii

12. If the O type red blood cell below has any blood type **antigens** on its surface, please draw them below and label. If not, leave blank.



Name Those Parents:

Hospitals typically have excellent measures in place to prevent mix-ups, but one baby was not so lucky. The hospital has narrowed down that baby Anthony must belong to one female and one male in the below list, although the hospital also does not know which individuals are couples. Find Anthony's parents!



Possible Parents:

homozygote impossible. Anthony needs to inherit an "i" allele.

Natasha (female) Blood Type: B	Adrianne (female) Blood Type: AB	Rafael (male) Blood Type: O	Joshua (male) Blood Type: AB
$I^B I^B$ OR $I^B i$	$I^A I^B$	ii	$I^A I^B$

Baby Anthony  Blood Type: O	13. Anthony's genotype: ii (from mom, from dad)	14. His mother from above list (list name): Natasha 15. Her genotype: $I^B i$	16. His father from above list (list name): Rafael 17. His genotype: ii

18. Draw the Punnett Square below that shows the cross between the mother and father you selected.

$ii \times I^B i$

	I^B	i
i	$I^B i$ Type B	ii Type O
i	$I^B i$ Type B	ii Type O

genotypic ratio
1 $I^B i$: 1 ii

phenotypic ratio
1 Type B : 1 Type O

19. What is the percent chance in the Punnett square that you drew of having an O baby? 50%

20. Can a baby that has blood type AB have one parent that is type O? Why or why not? If it is difficult to explain, try explaining with a Punnett Square diagram.

No. Genotype of baby is $I^A I^B$; one allele is inherited from each parent: I^A from one, I^B from the other.
But a type O parent has the ii genotype and has neither the I^A nor I^B alleles for their offspring to inherit.