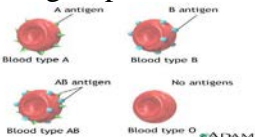




<p>Class Notes Understanding Blood & Blood Type Questions/Main Idea:</p>	<p>Name: _____ Period: _____ Date: _____</p> <p style="text-align: center;">Notes:</p>															
<p>What is blood?</p>	<ul style="list-style-type: none"> • Specialized body fluid • Four main components: red blood cells (carry oxygen), white blood cells (fight infection), platelets (clotting), plasma (90% water, also various proteins, sugar, vitamins, hormones, etc.) 															
<p>What are antigens and antibodies?</p>	<ul style="list-style-type: none"> • The differences in human blood are due to the presence or absence of certain protein molecules called antigens and antibodies • Antigens are proteins on the surface of the red blood cells' plasma membrane • Antibodies are proteins in the blood plasma 															
<p>What are the different blood groups?</p> 	<ul style="list-style-type: none"> • Individuals have different types and combinations of antigens and antibodies • The blood group you belong to depends on what you have inherited from your parents 															
<p>What are the genotypes and phenotypes of the blood groups?</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Phenotype</th> <th style="width: 25%;">Genotype</th> <th style="width: 50%;">Meaning</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">O</td> <td style="text-align: center;">ii</td> <td>Neither A nor B antigen present</td> </tr> <tr> <td style="text-align: center;">A</td> <td style="text-align: center;">$I^A i$ or $I^A I^A$</td> <td>Only A antigen is present</td> </tr> <tr> <td style="text-align: center;">B</td> <td style="text-align: center;">$I^B i$ or $I^B I^B$</td> <td>Only B antigen is present</td> </tr> <tr> <td style="text-align: center;">AB</td> <td style="text-align: center;">$I^A I^B$</td> <td>A & B antigens are present</td> </tr> </tbody> </table>	Phenotype	Genotype	Meaning	O	ii	Neither A nor B antigen present	A	$I^A i$ or $I^A I^A$	Only A antigen is present	B	$I^B i$ or $I^B I^B$	Only B antigen is present	AB	$I^A I^B$	A & B antigens are present
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<p>What happens when blood types mix?</p>	<ul style="list-style-type: none"> • Not all blood groups are compatible • Mixing incompatible blood groups leads to blood clumping, which can be fatal • Clumping occurs when antibodies of the recipients' blood attach to the antigens of the donor blood 															
<p>Which blood type is the universal donor, and why?</p>	<p>O blood type -- has no A or B antigens, so no recipient blood will attack it</p>															
<p>Which blood type is the universal receiver, and why?</p>	<p>AB blood type -- has no antibodies, so will not attack donor blood</p>															
<p>What is the Rh Factor?</p> 	<ul style="list-style-type: none"> • Rh is yet another antigen found on the surface of some people's red blood cells <ul style="list-style-type: none"> – Those who have the antigen are called Rh+ – Those who don't, are called Rh- • A person with Rh- blood can <i>develop</i> Rh antibodies if Rh+ blood is received (Rh antigens trigger production of Rh antibodies) • A person with Rh+ blood can receive blood from a person with Rh- blood without any problems 															

<p>Blood transfusions - who can receive blood from whom?</p>	<ul style="list-style-type: none"> • Transfusion works if a person who receives blood has a blood group that does <u>NOT have antibodies against the donor blood's antigens</u> • If a person who receives blood has antibodies matching the donor blood's antigens, the red blood cells in the <u>donated blood</u> will clump (BAD!)
<p>Give the possible genotypes & phenotypes of the following crosses:</p>	<ol style="list-style-type: none"> 1. $I^A I^A \times I^B i$ <ul style="list-style-type: none"> • Genotypes: $I^A I^B$ or $I^A i$ • Phenotypes: AB or A 2. $I^B i \times I^A i$ <ul style="list-style-type: none"> • Genotypes: $I^A I^B$, $I^B i$, $I^A i$, or ii • Phenotypes: AB, B, A, or O 3. Type O x Type AB <ul style="list-style-type: none"> • Genotypes: $I^A i$ or $I^B i$ • Phenotypes: A or B
<p>Who is Dr. Charles Drew?</p>	 <ul style="list-style-type: none"> • Today's American Red Cross blood program is the result of the efforts of Dr. Charles R. Drew, an African-American blood specialist, surgeon, educator, and scientist • His pioneering work in blood collection, plasma processing, and transfusion laid the foundation for modern blood banking.
<p>Summary:</p>	

1. **Who's Baby is it?** At the hospital, 2 newborn babies were accidentally mixed up and the parents questioned which baby belonged to whom. The blood groups of everyone involved is listed below. Determine which baby belongs to which couple.

Baby 1 – Type A	Mr. Brown – Type AB
Baby 2 – Type O	Mrs. Brown – Type B
	Mr. Smith – Type B
	Mrs. Smith – Type B

- Baby 1 must belong to Mr. and Mrs. Brown – they could not create a Type O (ii) baby, because only one parent could possibly contain the i allele
- Baby 2 must belong to Mr. and Mrs. Smith – they could not create a Type A ($I^A I^A$, $I^A i$) baby, because neither carries the I^A allele

2. **Which child is adopted?** The Tyler family has three kids, one of which is adopted. The blood types of the parents and children are listed below. Determine which child is adopted.

Mom – Type AB	John – Type B
Dad – Type O	Martha – Type AB
	Zackary – Type A

- Martha ($I^A I^B$) is adopted: Dad is Type O (ii) and could not have given either of her two alleles