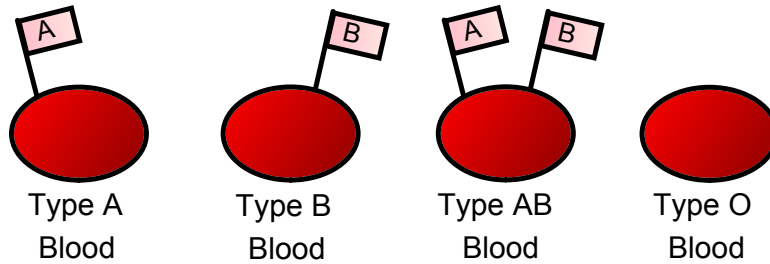
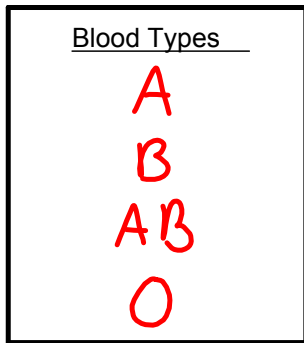


**Multiple Alleles** – Sometimes there may be more than two alleles for a given gene. One example of this is with human blood type.



The gene for blood type has three alleles...

- $i^A$  – Codes for an “A” tag .
  - $i^B$  – Codes for a “B” tag .
  - $i$  – Codes for no tags .
- }  $i^A$  and  $i^B$  are **co-dominant** .  
(They both show up.)
- $i$  is **recessive** to both  $i^A$  and  $i^B$ .

So, the codes to make each blood type are...

- Type A            $i^A i^A$           OR           $i^A i$
- Type B            $i^B i^B$           OR           $i^B i$
- Type AB                            $i^A i^B$
- Type O                            $i i$



If a woman with **Type A** blood marries a man with **Type B** blood, what are the possible blood types of their children?

Let's assume that both parents are **homozygous**.

Parent Codes

$i^A i^A$      $i^B i^B$

	$i^A$	$i^A$
$i^B$	$i^A i^B$ AB	$i^A i^B$ AB
$i^B$	$i^A i^B$ AB	$i^A i^B$ AB

What blood types would the children have?

Type AB blood

<u>Blood Type Codes</u>	
Type A	$- i^A i^A$ or $i^A i$
Type B	$- i^B i^B$ or $i^B i$
Type AB	$- i^A i^B$
Type O	$- ii$

Would this change if one of the parents was heterozygous?

Parent Codes

$i^A i$      $i^B i^B$

	$i^A$	$i$
$i^B$	$i^A i^B$ AB	$i^B i$ B
$i^B$	$i^A i^B$ AB	$i^B i$ B

What blood types would these children have?

Type B / Type AB

