Patterns of Inheritance

different ways to display Phenotypes

Genes can be inherited based on various patterns

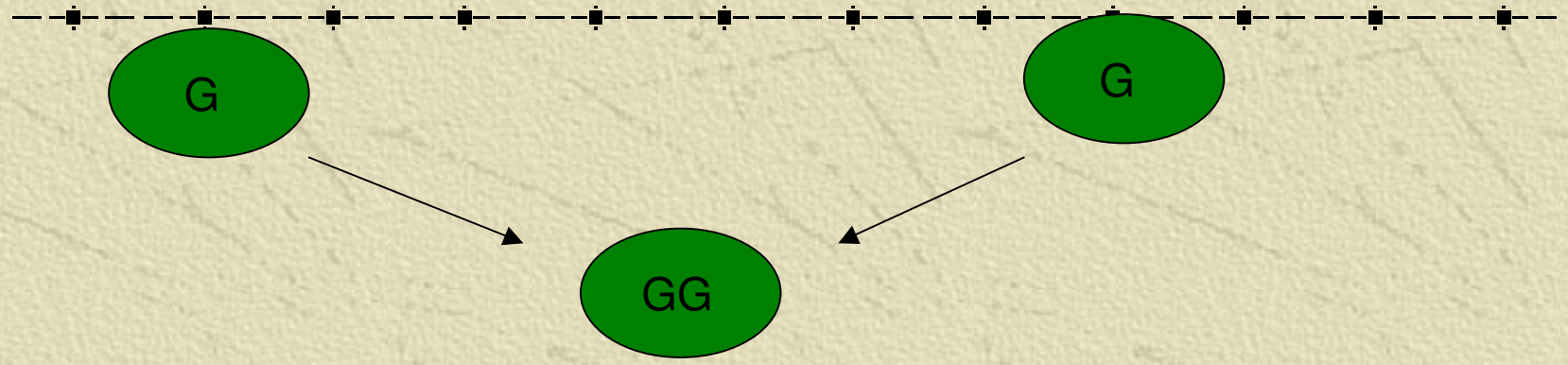
- Mendel's Dominance vs. Recessive
- Incomplete dominance
- Co-dominance
- Multiple alleles
- Multiple genes

Mendel's DOMINANT vs. recessive

- In this pattern one allele is designated **DOMINANT** while the other is **recessive**
- It only takes the presence or absence of the dominant allele to determine the phenotype
- There are only two possible phenotypes

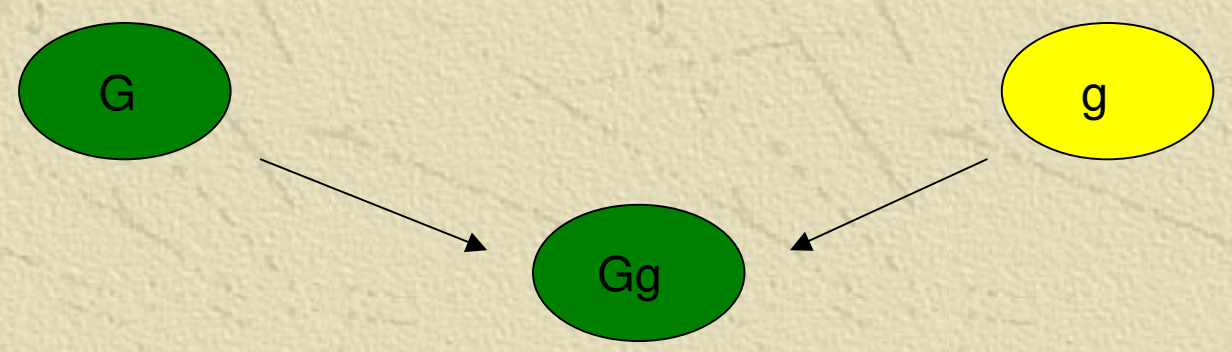
Homozygous dominant

Genotype = BB



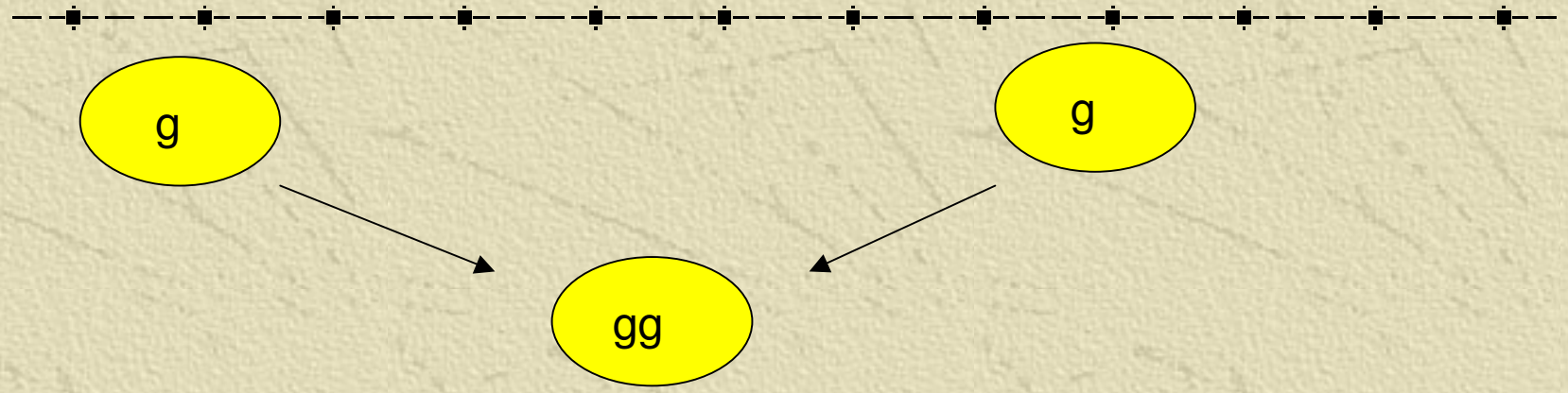
Heterozygous

Genotype = Bb



Homozygous recessive

Genotype = bb



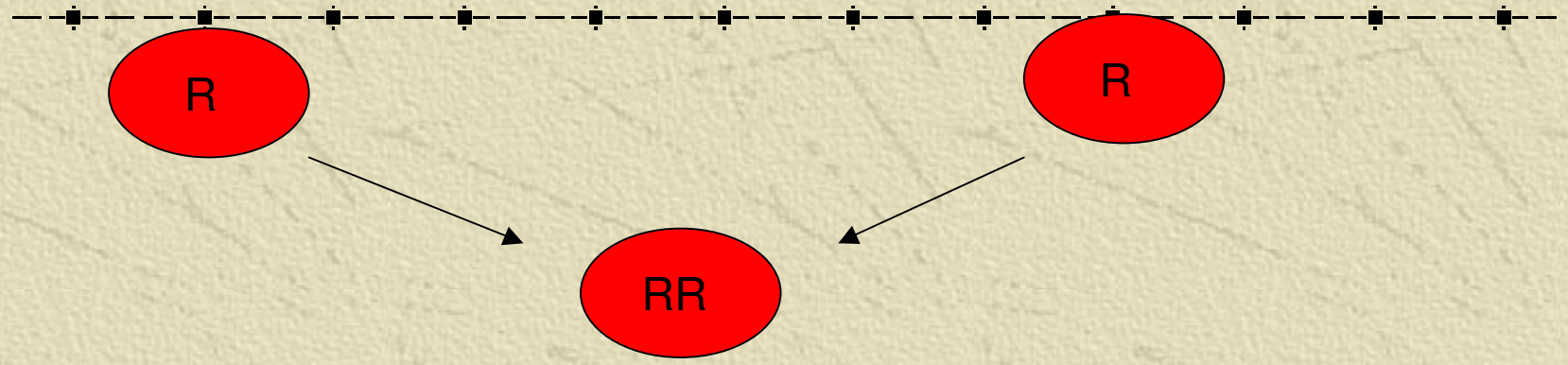
Incomplete Dominance

- In this pattern neither allele is considered recessive

- Heterozygous conditions produce a blend of the two traits creating a third phenotype.

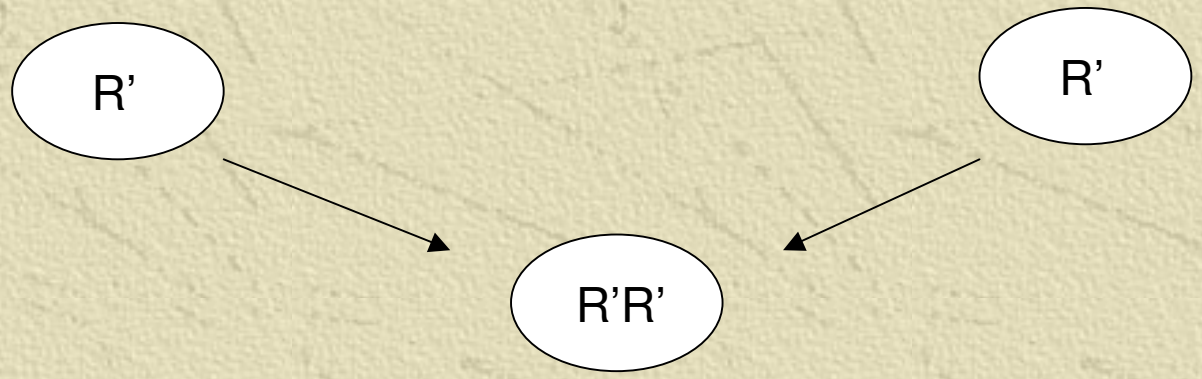
Homozygous condition 1

Genotype = RR



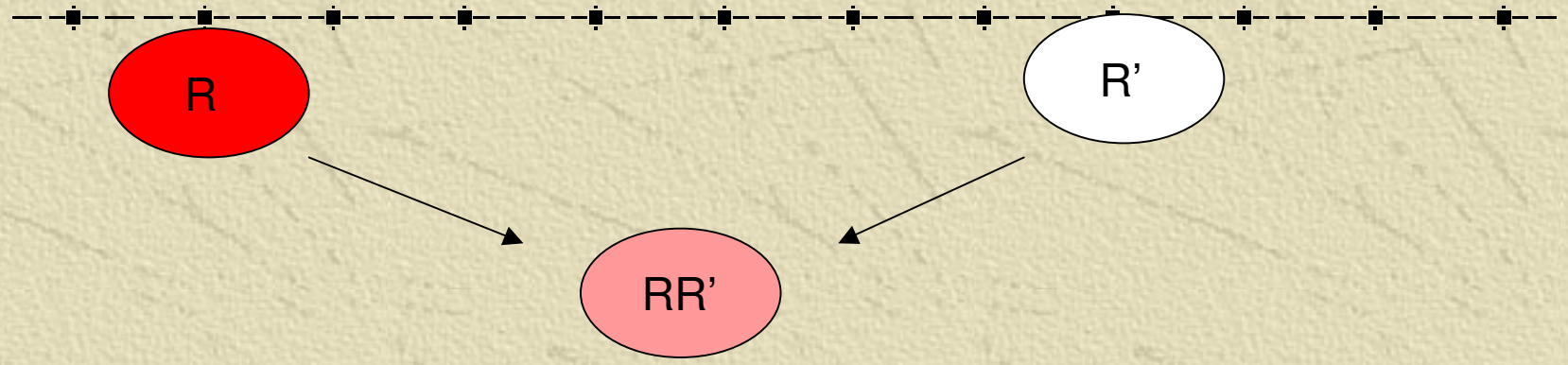
Homozygous condition 2

Genotype = R'R'



Heterozygous

Genotype = RR’



Co-dominance

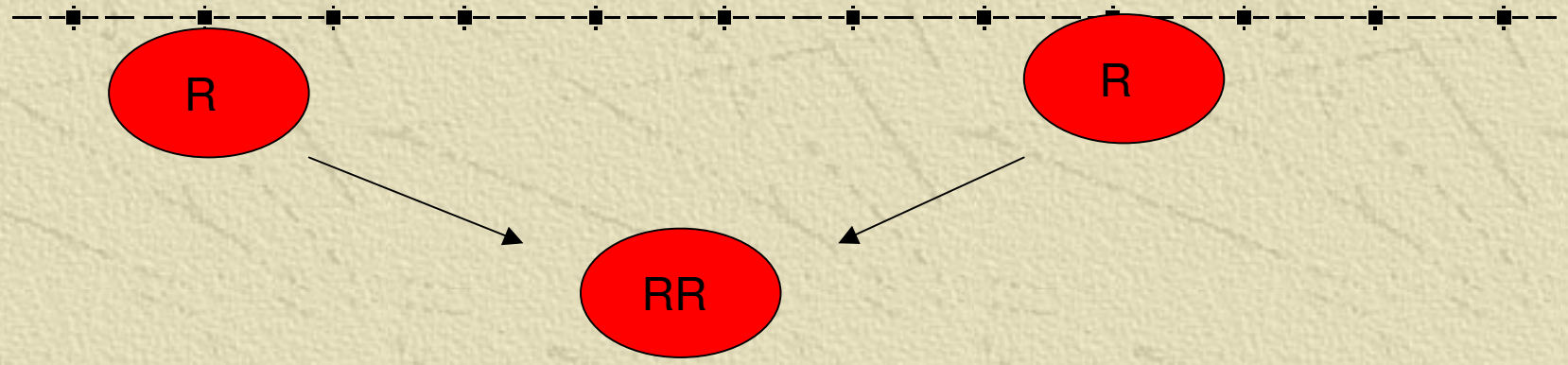
- In this pattern much like incomplete dominance, neither allele is considered recessive

- In a heterozygous condition where each type of allele is present the phenotype displays both traits from each allele

- There are 3 possible phenotypes

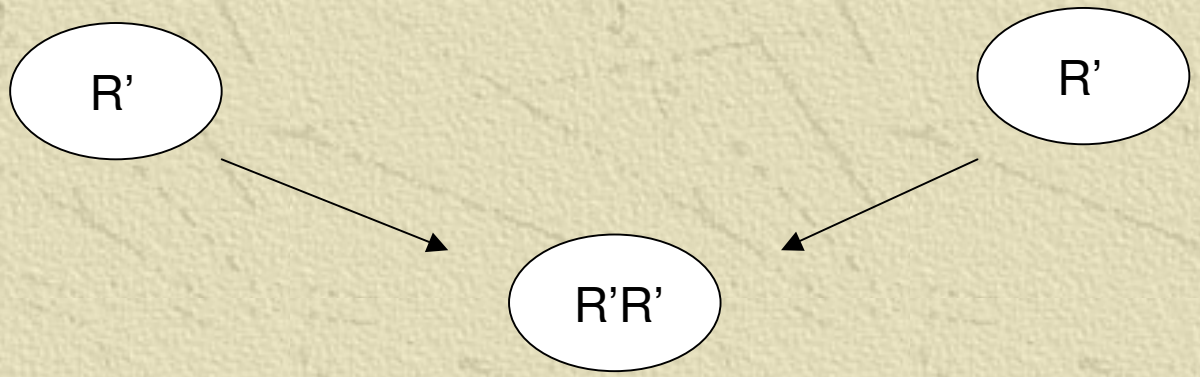
Homozygous Condition 1

Genotype = RR



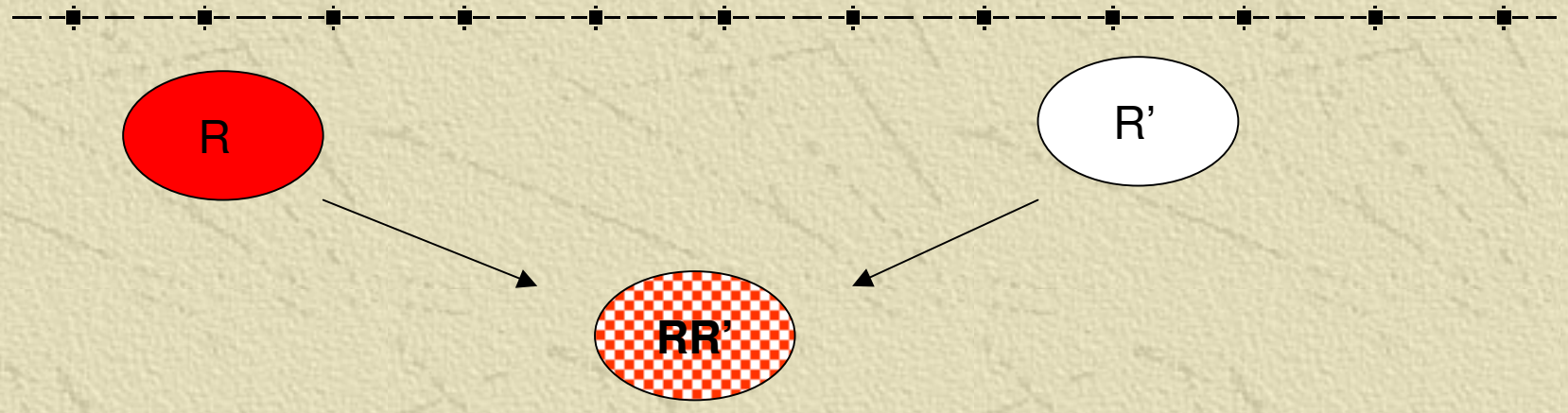
Homozygous Condition 2

Genotype = R'R'



Heterozygous

Genotype = RR’



Multiple alleles

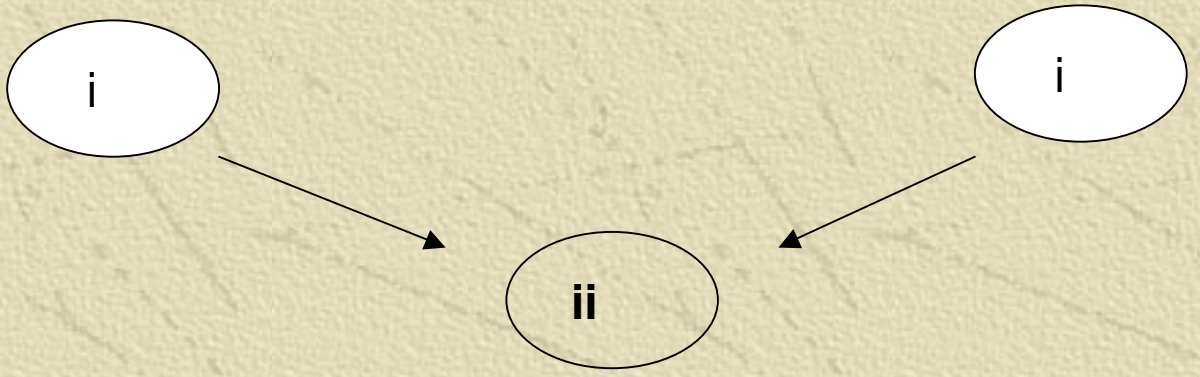
- In this pattern there is more than just two alleles (3 or more)
- Combinations of other patterns
  - Ex. Some alleles behave in a dominant/recessive fashion while other alleles display a co-dominant or incomplete dominant relationship
- This can lead to multiple phenotypes

Blood has 3 alleles

- 2 dominant (A and B – have a co-dominant relationship)
- 1 recessive (O has a recessive relationship with A and B)

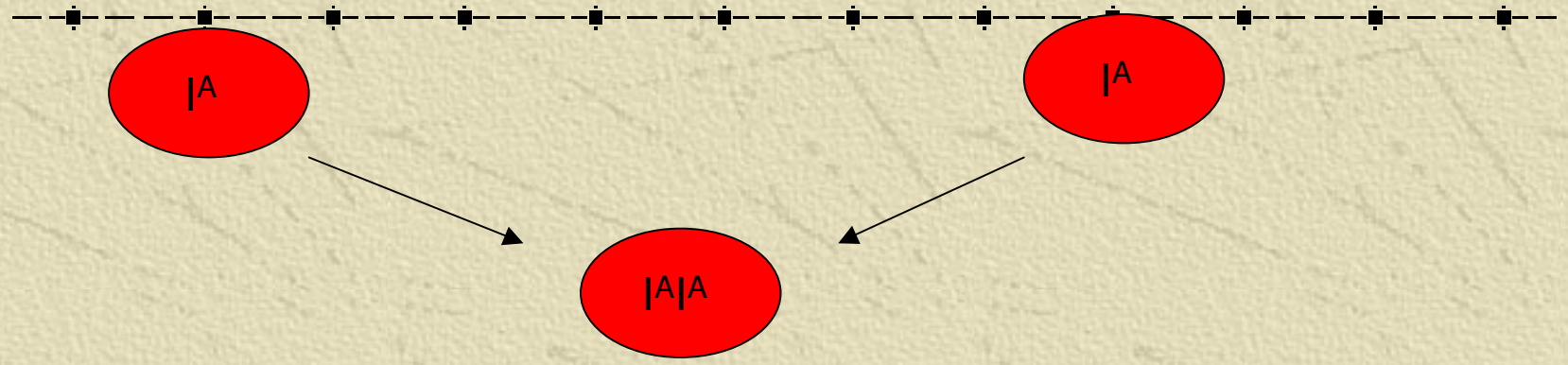
Homozygous recessive

Genotype = ii



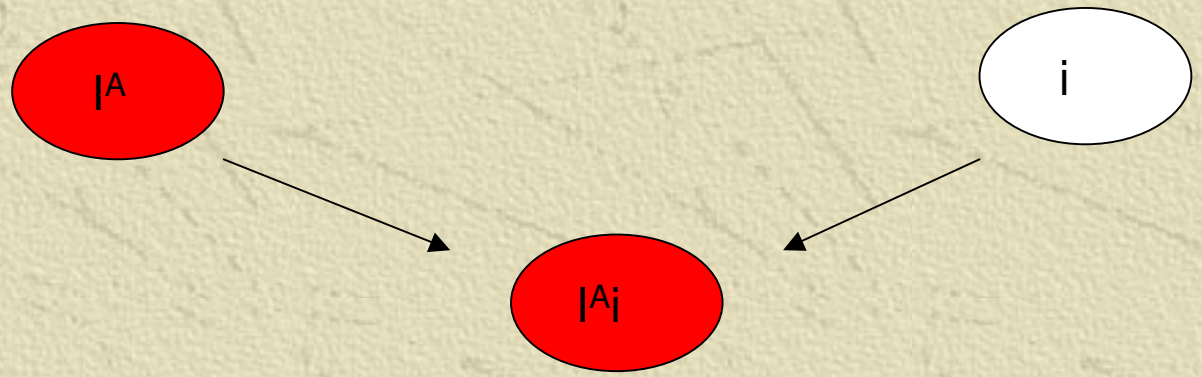
Homozygous for A

Genotype = $I^A I^A$



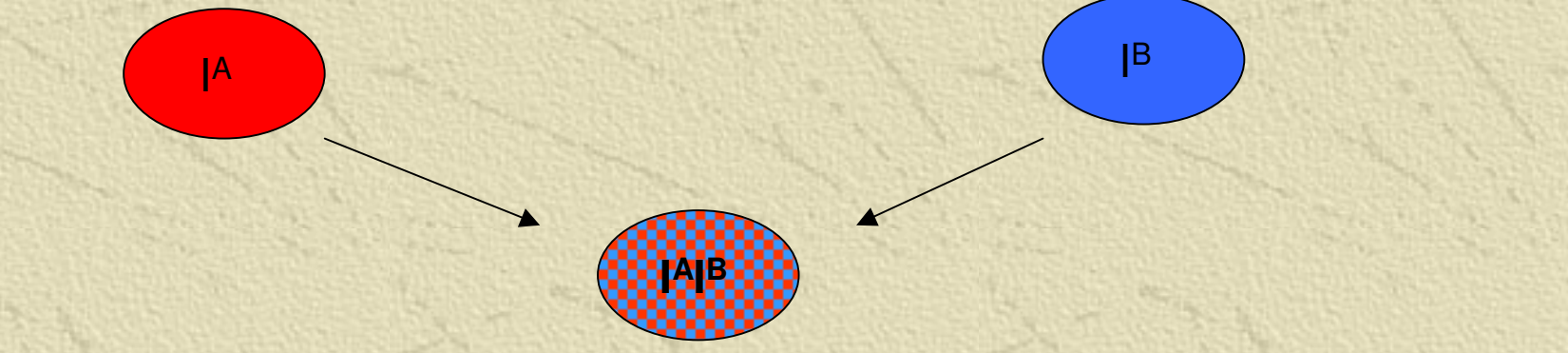
Heterozygous for A and O (dominant and recessive)

Genotype = $I^A i$



Heterozygous for A and B **(co-dominance)**

Genotype = I^AI^B

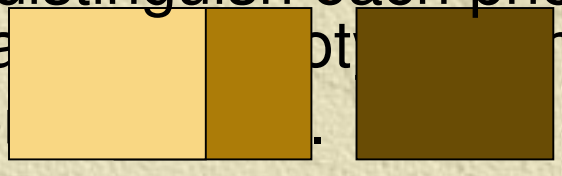


Multiple Genes

- In this pattern there is more than one gene responsible for a single trait
- Makes it possible for many types of genotypes and phenotypes
- Continuous variation

With simple patterns of inheritance like dom/rec, co-dominance and incomplete dominance

It's very easy to distinguish each phenotype you may only get a[illegible]ot[illegible]nd each is distinct from o[illegible].



Imagine people with only these skin colors

When there are multiple genes involved with a single trait you can expect more of a continuum of variation. This is more representative of human skin color