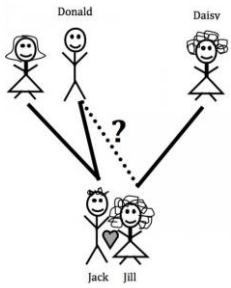
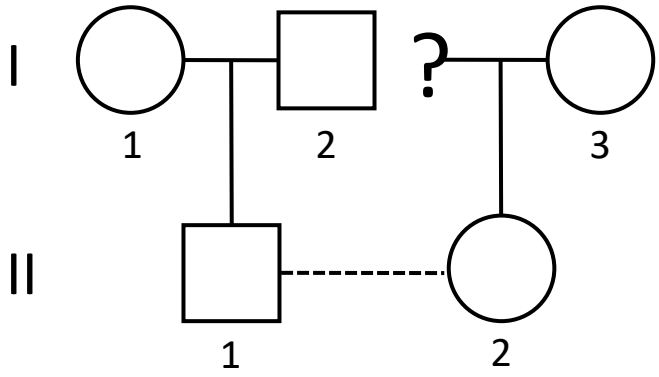
Remember Jack and Jill



Let's see if we can help them

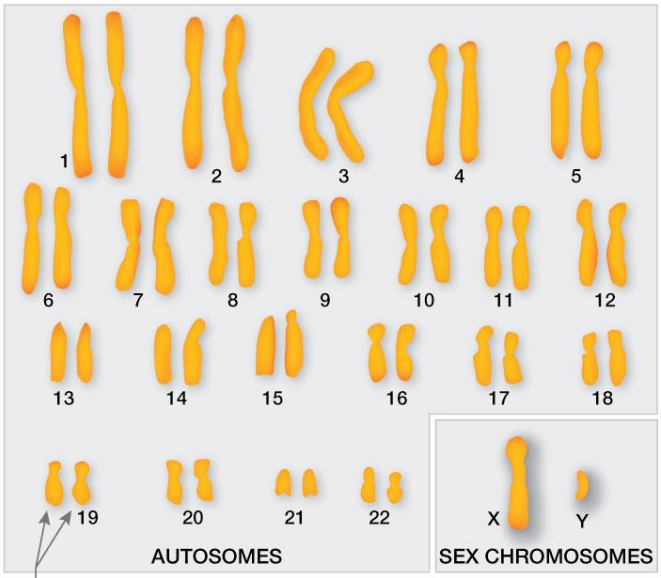
Gene	Jack		Jack's Mother		Jack's Father (Donald)		Jill		Jill's Mother (Daisy)	
	Phenotype	Genotype	Phenotype	Genotype	Phenotype	Genotype	Phenotype	Genotype	Phenotype	Genotype
Freckles	Present		Absent		Absent		Present		Present	
Blood Antigen Type	O		A		B		O		B	
Blood Rh Antigen	Absent		Present		Present		Present		Present	
Color Vision	Normal		Normal		Red/Green Colorblind		Red/Green Colorblind		Normal	
Nail-patella disorder	Absent		Absent		Present		Absent		Present	

1



- Filled symbols distinguish between phenotypes
- Circles = females, squares = males.
- Horizontal lines between two symbols = individuals who mated, branches going down = their offspring.
- Roman numerals to the left indicate each generation, and Arabic numerals distinguish individuals within a generation from each other. For example: I1 = Jack's mother, I2 = Donald, I3 = Daisy, II1 = Jack, and II2 = Jill.

2



Pair of homologous chromosomes:

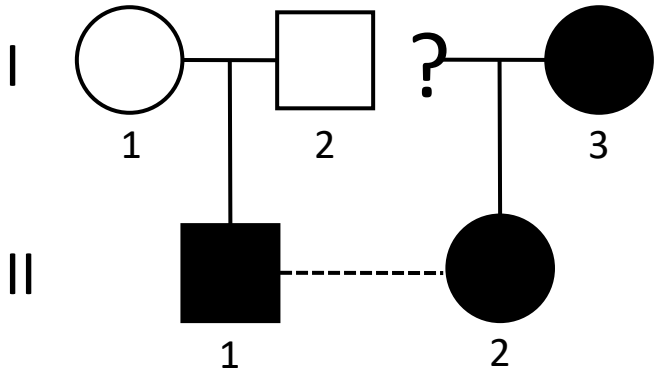
- *One from mom and one from dad*
- *Have the same genes arranged in the same order*
- *Slightly different DNA sequences*

3

Freckles = ○ **or** □ **No freckles =** ● **or** ■

What is the Genotype of Jack?

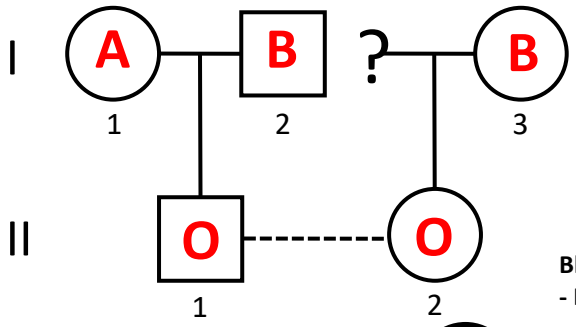
A. FF
B. Ff
C. ff



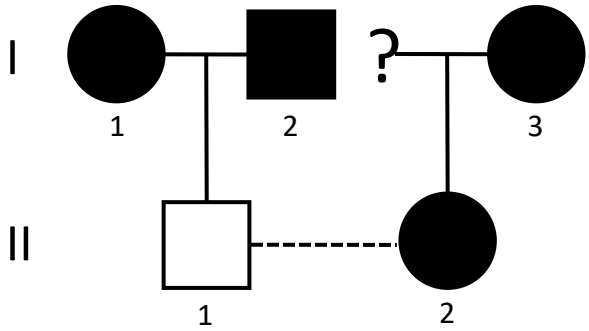
What kind of inheritance pattern do you see?
Complete dominance or
autosomal dominant/recessive inheritance

4

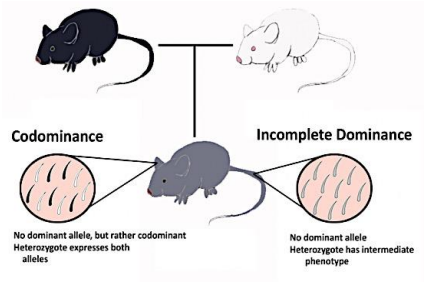
Blood Type (on chromosome 9)

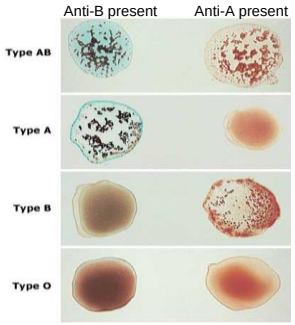


Blood Rh (on chromosome 1)
- Is recessive (not filled in)



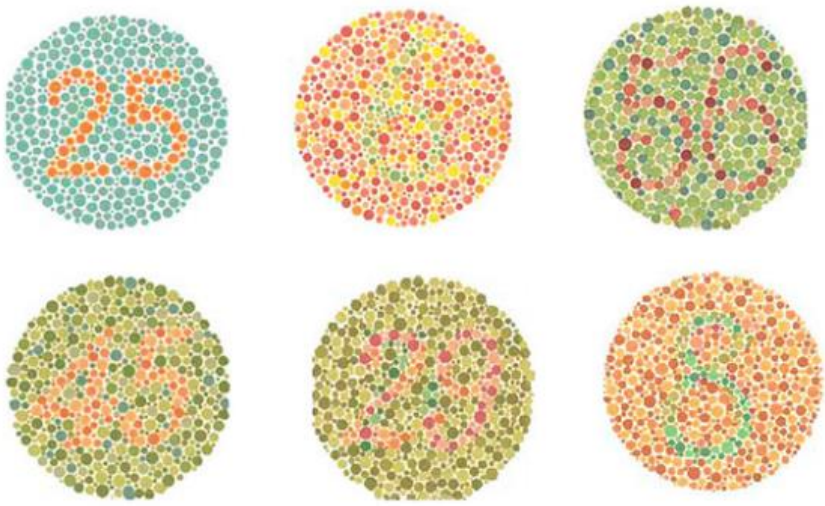
5





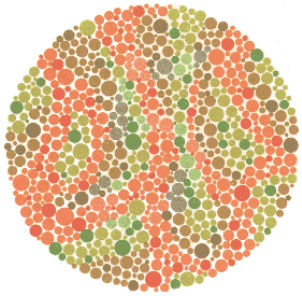
Possible genotypes	Antigens Made	Blood Type
I^AI^A	A only	A
I^Ai		
I^BI^B	B only	B
I^Bi		
I^AI^B	A and B	AB
ii	None	O
Rh Factor		
++ / +-	Rhesus factor present	Rh+
--	Rhesus factor absent	Rh-

6



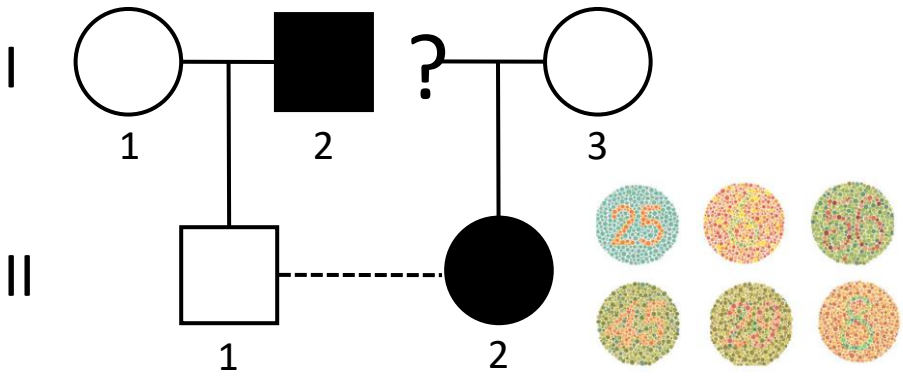
7

People with normal vision or total color blindness should not be able to see any number.
Those with red green color blindness should see a 5.



8

Red-green colorblindness

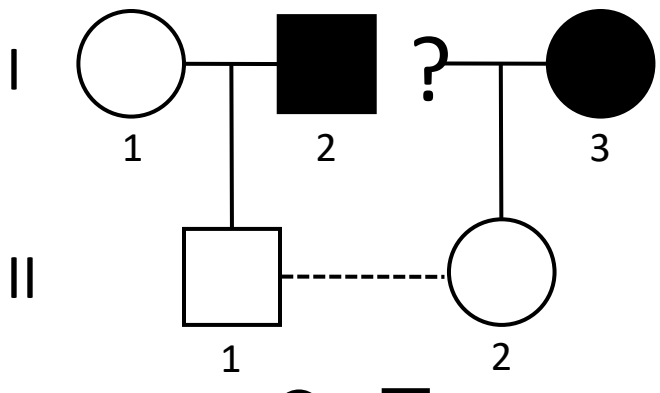


Colorblind = ● **or** ■

Normal Male: X^AY
Colorblind Male: X^aY
Normal Female (non-carrier): X^AX^A
Normal Female (carrier): X^AX^a
Colorblind Female: X^aX^a

9

Nail-patella disorder (Located on chromosome 9)



Disorder present = ● **or** ■

Autosomal dominant

10