

Codominance/Incomplete Dominance Practice Problems

1. Mom has type A blood. Dad has type AB blood. What possible blood types could their children inherit? (Show all possibilities).

Mom = AA or AO  
Dad = AB

	A	A
A	AA	AA
B	AB	AB

	A	O
A	AA	AO
B	AB	BO

} Types  
A  
AB  
B

2. Mom has type O blood. Dad has type AB blood. What percentage of their kids will inherit type B blood?

	O	O
A	AO	AO
B	BO	BO

kids = 50%

3. Mom has type B blood. Dad has type O blood. They have a child with type O blood. Make a punnett square to show what Mom's genotype must be to have a child with type O blood.

Mom = BB or BO  
Dad = OO

(it has to be BO)

	B	O
O	BO	OO
O	BO	OO

4. A woman sues a man for child support, claiming he is the father of her illegitimate child. The woman is type A blood, the man is type B blood, and the child is type O blood. Show how it is possible for this man to be the father of this child.

Mom = AO  
Man = BO

	A	O
B	AB	BO
O	AO	OO

possible if AO/BO parents.

5. A woman sues a man for child support, claiming that he is the father of her illegitimate child. The woman is type A, the child is type O, and the man is type AB. Could he be the father of her child? Show why or why not.

Mom = AA or AO  
Child = OO  
Man = AB

	A	O
A	AA	AO
B	AB	BO

→ Not likely.  
No OO

6. A wealthy elderly couple dies together in an accident. A man comes forward, claiming that he is their long lost son and is entitled to their fortune. The couple was of blood types AB and O. The man has type O blood. Could he be the heir to the fortune? Show why or why not.

	A	B
O	AO	BO
O	AO	BO

→ OO Blood type not possible, not the heir

7. John has type O blood. He knows his mother had type B blood. He does not know the identity of his father, however. What possible blood types could his father have had? Show your work.

John = OO  
Mom = BO

	B	O
O	BO	OO
O	BO	OO

	B	O
A	AB	AO
O	BO	OO

	B	O
B	BB	BO
O	BO	OO

Father = OO, AO, BO

8. Mike has type AB blood. Paul has type O blood. Mike knows that his Mom had type B blood. Show how it could be possible for Mike and Paul to be brothers.

$Mike = AB$   
 $Paul = OO$

B O	
A	B
O	O

$\rightarrow$  Father is AO } AB possible for kids  
 mom is BO } OO possible for kids

9. Alice has type O blood. Jessica has type B blood. Jessica's mom had type O blood. Show how it is possible that Jessica and Alice are not sisters.

$Alice = OO$   
 $Jessica = BB \text{ or } BO$   
 $Mom = OO$

O O	
B	B
B	B

$\rightarrow$  No OO blood type - not sisters

10. Mom has curly hair and Dad has wavy hair. What kind of hair will their kids have?

$WW = curly$   
 $Ww = wavy$

W W	
W	w
w	w

50% chance curly  
 50% chance wavy

11. In a family of four, 1 child has curly hair, 1 child has straight hair, and 2 children have wavy hair. Show what the genotypes of the parents would have to be.

Parents are =  $Ww$  both

W w	
W	w
w	w

12. Show how it is possible to get a red four o'clock plant and a white four o'clock plant from two pink parents.

Cross  $Rr \times Rr$

R r	
R	r
r	r

13. What are the odds of getting a white four o'clock plant if the parents are pink and white?

R r	
R	r
r	r

50%

14. A couple, both of whom have the sickle cell trait, are considering having children. They want to know the odds of having a child with sickle cell disease. What would you tell them?

Couple genotype =  $Hb^A Hb^S$

Hb <sup>A</sup> Hb <sup>S</sup>	
Hb <sup>A</sup>	Hb <sup>S</sup>
Hb <sup>S</sup>	Hb <sup>S</sup>

$\frac{1}{4}$  chance of  $Hb^S Hb^S$

15. In a family of four, all four children have the sickle cell trait. Show what the parents' genotypes must be.

All kids =  $Hb^A Hb^S$

Hb <sup>A</sup> Hb <sup>A</sup>	
Hb <sup>S</sup>	Hb <sup>S</sup>
Hb <sup>S</sup>	Hb <sup>S</sup>

Parents =  $Hb^A Hb^A$   
 $Hb^S Hb^S$