****

Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Period \_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_

**Codominance Worksheet (Blood types)**

Human blood types are determined by genes that follow the **CODOMINANCE** pattern of inheritance.

There are two dominant alleles (A & B) and one recessive allele (O).

|  |  |  |  |
| --- | --- | --- | --- |
| Blood Type (Phenotype) | Genotype | Can donate blood to: | Can receive blood from: |
| O | ii (OO) | A,B,AB and O  (universal donor) | O |
| AB | IAIB | AB | A,B,AB and O  (universal receiver) |
| A | IAIA or IAi (IAO) | AB, A | O,A |
| B | IBIB or IBi (IBO) | AB,B | O,B |

1. Write the genotype for each person based on the description:
   1. Homozygous for the “B” allele \_\_\_\_\_\_\_\_\_
   2. Heterozygous for the “A” allele \_\_\_\_\_\_\_\_\_
   3. Type O \_\_\_\_\_\_\_\_\_
   4. Type “A” and had a type “O” parent \_\_\_\_\_\_\_\_\_
   5. Type “AB” \_\_\_\_\_\_\_\_\_
   6. Blood can be donated to anybody \_\_\_\_\_\_\_\_\_

|  |  |
| --- | --- |
|  |  |
|  |  |

* 1. Can only get blood from a type “O” donor \_\_\_\_\_\_\_\_\_

1. Pretend that Brad Pitt is homozygous for the type B allele, and Angelina Jolie is type “O.”

**What are all the possible blood types of their baby?** *(Do the punnett square)*

*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

|  |  |
| --- | --- |
|  |  |
|  |  |

1. Complete the punnett square showing all the possible blood types for the offspring produced

by a type “O” mother and an a Type “AB” father. **What are percentages of each offspring?**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Mrs. Essy is type “A” and Mr. Essy is type “O.” They have three children named Matthew, Mark, and Luke. Mark is type “O,” Matthew is type “A,” and Luke is type “AB.” Based on this information:

|  |  |
| --- | --- |
|  |  |
|  |  |

* 1. Mr. Essy must have the genotype \_\_\_\_\_\_
  2. Mrs. Essy must have the genotype \_\_\_\_\_\_ because \_\_\_\_\_\_\_\_\_\_\_ has blood type \_\_\_\_\_\_
  3. Luke cannot be the child of these parents because neither parent has the allele \_\_\_\_\_.

1. Two parents think their baby was switched at the hospital. Its 1968, so DNA fingerprinting technology does not exist yet. The mother has blood type “O,” the father has blood type “AB,”

and the baby has blood type “B.”

|  |  |
| --- | --- |
|  |  |
|  |  |

* 1. Mother’s genotype: \_\_\_\_\_\_\_
  2. Father’s genotype: \_\_\_\_\_\_\_
  3. Baby’s genotype: \_\_\_\_\_\_ or \_\_\_\_\_\_\_\_
  4. Punnett square showing all possible genotypes for children produced by this couple.
  5. Was the baby switched? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Two other parents think their baby was switched at the hospital. Amy the mother has blood type “A,” Linville the father has blood type “B,” and Priscilla the baby has blood type “AB.”

|  |  |
| --- | --- |
|  |  |
|  |  |

* 1. Mother’s genotype: \_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_
  2. Father’s genotype: \_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_
  3. Baby’s genotype: \_\_\_\_\_\_
  4. Punnett square that shows the baby’s genotype as a possibility
  5. Could the baby actually be theirs? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Based on the information in this table, which men **could not** be the father of the baby?

*(hint… look at the baby’s blood type only…)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

**You can use the Punnett square if you need help figuring it out.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Blood Type**   |  |  | | --- | --- | |  |  | |  |  | |
| Mother | Type A |
| Baby | Type B |
| The mailman | Type O |
| The butcher | Type AB |
| The waiter | Type A |
| The cable guy | Type B |

**BLOOD TYPE & INHERITANCE**

In blood typing, the gene for type A and the gene for type B are codominant. The gene for type O is recessive. Using Punnett squares, determine the possible blood types of the offspring when:

1. Father is type O, Mother is type O

|  |  |
| --- | --- |
|  | \_\_\_\_\_\_\_\_\_\_% O  \_\_\_\_\_\_\_\_\_\_% A  \_\_\_\_\_\_\_\_\_\_% B  \_\_\_\_\_\_\_\_\_\_% AB |
|  |  |

2. Father is type A, homozygous; Mother is type B, homozygous

|  |  |
| --- | --- |
|  |  |
|  |  |

\_\_\_\_\_\_\_\_\_\_% O

\_\_\_\_\_\_\_\_\_\_% A

\_\_\_\_\_\_\_\_\_\_% B

\_\_\_\_\_\_\_\_\_\_% AB

1. Father is type A, heterozygous; Mother is type B, heterozygous

\_\_\_\_\_\_\_\_\_\_% O

\_\_\_\_\_\_\_\_\_\_% A

\_\_\_\_\_\_\_\_\_\_% B

\_\_\_\_\_\_\_\_\_\_% AB

|  |  |
| --- | --- |
|  |  |
|  |  |

1. Father is type O, Mother is type AB

\_\_\_\_\_\_\_\_\_\_% O

\_\_\_\_\_\_\_\_\_\_% A

\_\_\_\_\_\_\_\_\_\_% B

\_\_\_\_\_\_\_\_\_\_% AB

|  |  |
| --- | --- |
|  |  |
|  |  |

1. Father and Mother are both type AB

\_\_\_\_\_\_\_\_\_\_% O

\_\_\_\_\_\_\_\_\_\_% A

\_\_\_\_\_\_\_\_\_\_% B

\_\_\_\_\_\_\_\_\_\_% AB

|  |  |
| --- | --- |
|  |  |
|  |  |