TedEd “Why do blood types matter?” by Natalie S. Hodge 4:41 Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

<https://www.youtube.com/watch?v=xfZhb6lmxjk> Period \_\_\_\_Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

***STATION 5—Watch this video and answer the questions.***

1. What are antigens?

A. Anti-generational glycoproteins

B. Harmful disease-causing microorganisms

C. Any foreign substance that induces an immune response

D. Antibodies produced by the immune system in response to a pathogen

2. What is the main function of erythrocytes (red blood cells)?

A. to deliver oxygen to cells

B. to deliver carbon dioxide to tissues

C. to clot blood after a vessel is punctured

D. to deliver nutrients, such as glucose, to cells

3. If a person inherits the A allele from his mother, and the B allele from his father,

what will his blood type be?

A. Type A

B. Type B

C. Type AB

D. Type O

4. Why are people with Type O blood considered universal donors?

A. Their erythrocytes (red blood cells) have both the A and the B antigens, so their body doesn’t make any antibodies.

B. Their erythrocytes have neither A nor the B antigen, so there are no antigens to induce an immune response in the recipient.

C. Their erythrocytes have neither the A nor the B antigen, so their body doesn’t make any antibodies.

D. Their erythrocytes may have the A or the B antigen, so they mutate to conform to the recipient’s blood type.

5. What is RH factor?

A. Rheumatoid factor, which indicates the likelihood of contracting Rheumatoid arthritis

B. Rhesus factor, another type of antigen on erythrocytes (red blood cells)

C. Red hemoglobin factor, indicating the presence of red blood cells

D. Red herring factor, a chemical that confuses white blood cells.

Blood type is controlled by 3 alleles: A, B, O A & B are codominant, O is recessive

6. a. What are the two genotypes possible for a person who has A type blood? \_\_\_\_\_\_\_

b. What genotype does a person with AB blood have? \_\_\_\_\_\_\_\_\_

c. What genotype does a person with O blood have? \_\_\_\_\_\_\_\_\_

d. What are the two genotypes possible for a person who has B type blood? \_\_\_\_\_\_

7. A man with type AB blood is married to a woman also with type AB blood.

What is the genotype percentages of their children: **Show on a Punnett square**

A blood \_\_\_\_\_\_\_

B blood \_\_\_\_\_\_\_

O blood \_\_\_\_\_\_\_

AB blood\_\_\_\_\_\_\_

8. A man has type B blood (genotype BB) is married to a woman with type O blood (oo).

What is the genotype percentages of their children: **Show on a Punnett square**

A blood \_\_\_\_\_\_\_

B blood \_\_\_\_\_\_\_

O blood \_\_\_\_\_\_\_

AB blood\_\_\_\_\_\_\_

9. My husband is type AB blood, I’m type OO and my children’s blood types are as follows:

Ryan: OO

Tim: A

Andy: B

Megan: A

Do a Punnett square and tell me which child was adopted? \_\_\_\_\_\_\_\_\_\_\_\_\_\_

10. Let’s say your name is Gilligan, you’ve survived a shipwreck and you’re stranded on a desert island. You happen to have been stranded with a medical doctor that has a limited stock of medical supplies. One of your shipmates is in desperate need of a blood transfusion but doesn’t know his blood type. You do know your blood type. How could you type his blood with your knowledge and limited medical supplies?

**Station 6**

Two weeks ago Sarah got a knock on her door while her children were at school. A frantic woman named Beth was pleading to be let in to tell “her story”. Beth proceeded to tell Sarah that they both have daughters who were born on October 13th, 2005. Even more perplexing is that Beth not only delivered her baby at the same hospital as Sarah (Providence Medical Center) but within the same time frame as Sarah.

Beth thinks that Sarah’s baby girl, Darla, and her baby girl were accidentally switched by the hospital staff. Sarah is not quite sure this is true since **Sarah’s homozygous blood type is A**, and her daughter, **Darla, is heterozygous type A**. Sarah’s **husband is heterozygous type B**. The woman claiming that her daughter was switched at birth, **Beth**, is **homozygous type B** and her **husband is type AB**.

Before Sarah goes and tells her daughter the biggest shock of her life she wants to make sure Beth is correct and not crazy. Show using Punnett squares if Beth is correct about their daughters being switched at birth.

Once you have figured out if Beth is correct write an explanation to Sarah explaining your findings and how you got to them. Be as detailed as possible so Sarah is fully convinced.

**Station 7**

The year is 2008. Mr. and Mrs. Green are the parents of a beautiful baby boy they name Michael. When Michael was about 6 months old Mrs. Green took Michael with her grocery shopping at Safeway. When Mrs. Green arrived at Safeway, she put Michael on a blanket in the grocery cart. Unfortunately, this day would prove to be unlike any other day.

The day replays in Mrs. Green’s head over and over again. She was headed toward the meat department when she noticed a really good sale on fresh tuna. She turned her back for a minute while confirming the sale price with the clerk and when she turned back again Michael was gone. Someone had kidnapped him.

After checking with the store clerks and the manager, no one had seen anything unusual. The store manager immediately called the police. The Green’s put up flyers and even put a missing ad on a milk carton. They realized they never had Michael’s blood typed but they, (**the Greens)**, knew they were both **heterozygous type A blood**. The Greens and police searched and searched for over six months when finally they got a tip.

Mrs. Valley had called the police department claiming that her neighbors, the Blackhearts, were acting strange, and they had seen a one year old playing in the Blackhearts’ backyard. The police contacted the Greens and she just knew that this must be her baby Michael. After typing **Mrs. Blackhearts’** blood, the police determined that she was **homozygous type B.** **The man** she claims to be the father of her one year old is

**type O.** After blood typing the baby boy, Michael, the police determine that the **Michael’s blood type is also O**.

Determine, using Punnett squares, if these strange neighbors, the Blackhearts, are telling the truth or not. Write an explanation to the police department with your findings. Be as detailed as possible.

**Station 8**

Maria is a 13 year old girl who lives in Medford but was born in Florida. When she was 10 days old she was left on the front step of a fire station with a sign laying on top of her blanket that read “please find me a good home”. The fire department immediately passed the infant over to child protective services where she was put up for adoption.

Two months later a loving couple who could not conceive a baby on their own came and adopted Maria. She has lived a wonderful life, with wonderful parents and is looking forward to starting high school next year.

As much as Maria loves her family she can’t stop thinking about who her real parents are. Maria decided back in the beginning of 7th grade that she was going to save money to hire a detective to find her biological parents. After saving over $800 Maria is ready to find her parents. She hired a detective and gave him all the information. **Maria** included her **blood type** which is **O**. The detective said he will not take any of her money until after he has found her parents.

Two weeks later the detective came back with pictures, information and addresses of who the detective says are her biological parents. Her **biological father** is an architect living in Chicago and has **heterozygous type B blood**. Her biological mother is a Broadway actress living in Hollywood and has **heterozygous type A blood.** The detective says that the Maria also has a **biological brother** who is 9 years old with type **AB blood.**

Before Maria pays the detective her savings, you must determine using Punnett squares if the detective was correct and how you know. Then, write an explanation to Maria telling her to either pay the detective or not and why. Make sure to be as detailed as possible.

**Station 6—Sarah—Was the Baby Switched at Birth?**

Show Punnett Square Work

Explanation:

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

**Station 7—Is it Mrs. Green’s Baby?**

Show Punnett Square Work

Explanation:

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**Station 8—Did Maria Find Her Birthparents?**

Show Punnett Square Work

Explanation:

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

**Practice Problems**

1. A man with type AB blood marries a woman with type AB blood. Show their possible offspring using a Punnett square.

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

2. A man has homozygous type B blood and is married to a woman with type O blood. Using a Punnett square show the possible blood types their children could have?

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

3. A woman who has blood type B has a child who has blood type O. What could the genotypes of the father be? What is the genotype of the mother? Show your work using Punnett squares.