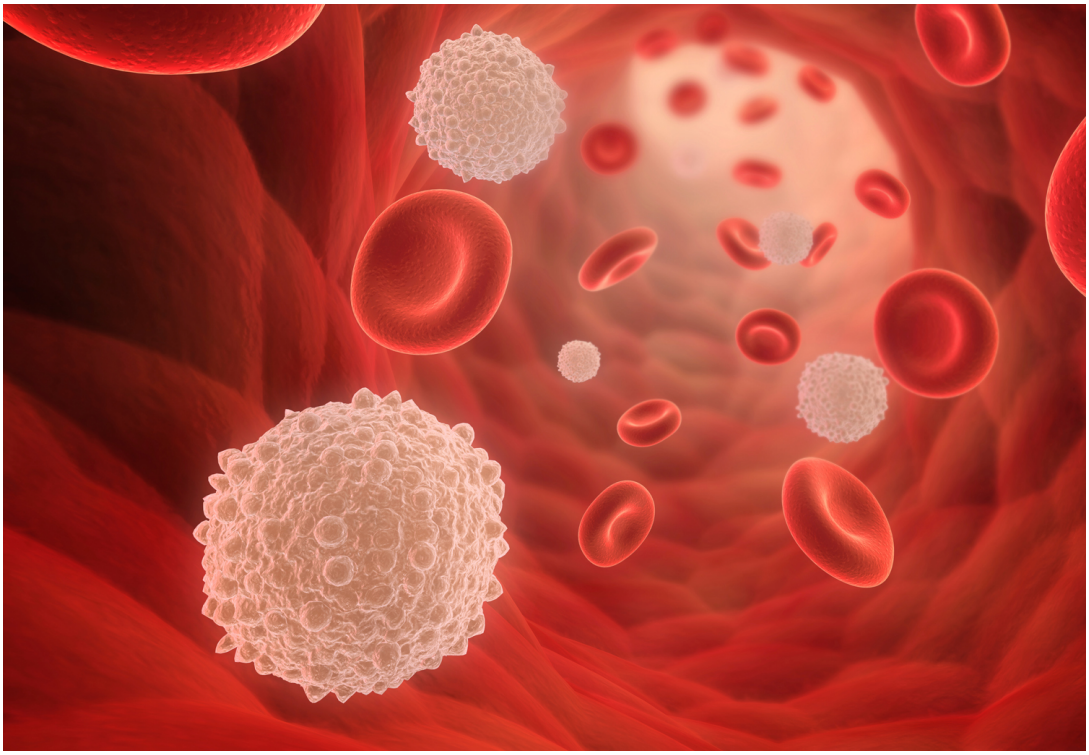
Name: _____ Per: _____ Date: _____

Unit 9a: Blood: (Composition/Types/Inheritance)



By the end of the unit, you will be able to:

- Explain the components of blood
- Describe the function of blood cells
- Describe how to determine the blood type of a sample of blood
- Calculate the probability of certain blood types within a population

Unit Vocabulary:

- Red Blood Cells (RBC): _____
- Hemoglobin: _____
- White Blood Cell (WBC): _____
- Plasma and Platelets: _____
- Antigens: _____
- Genotype: _____
- Blood Type: _____
- Blood Transfusion: _____
- Universal Donor/Recipient: _____
- Rh Factor: _____
- Rh+/Rh-: _____

Name: _____ Per: _____ Date: _____

YOYO: Using your prior knowledge about blood and its function to fill in the blanks below. Use the word box to help you.

Word Bank

Oxygen • Platelets • Red • White • Bank • Lungs • Plasma • Food • Body

1. Red blood cells carry _____.
2. Blood gets oxygen from your _____.
3. Blood carries _____ nutrients from the intestines.
4. _____ blood cells fight germs.
5. Blood travels to all parts of your _____.
6. The liquid part of the blood is called _____.
7. _____ blood cells give blood its color.
8. _____ form blood clots.
9. Adults donate blood at a blood _____.

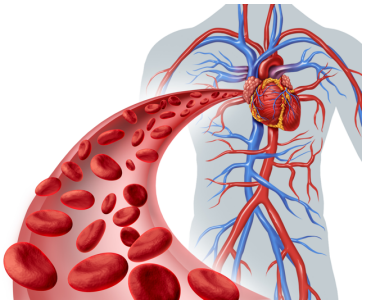
Blood Facts

- The average adult has about _____ liters of blood inside of their body, which makes up _____ of their body weight.
  - That's 2 ½ bottles of soda
- There are about one _____ red blood cells in two to three drops of blood.
- For every _____ red blood cells, there are about ____ platelets and _____ white cell.

How many red blood cells does an average human have?

Why do we have blood?

- Blood is living _____ that carries _____ and _____ to all parts of the body, and carries _____ and other _____ products back to the lungs, kidneys and liver for disposal.

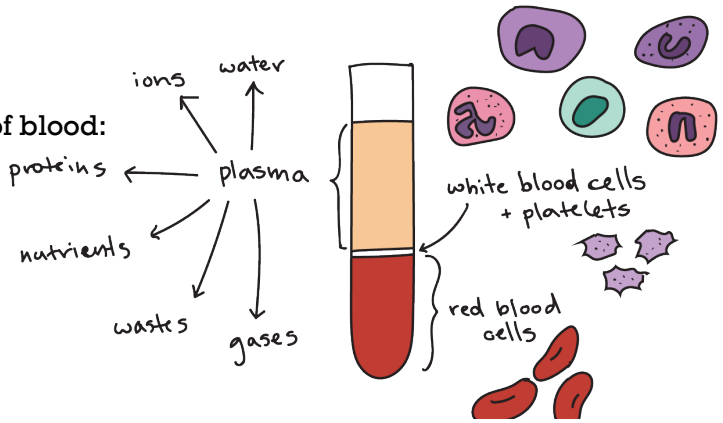


Name: _____ Per: _____ Date: _____

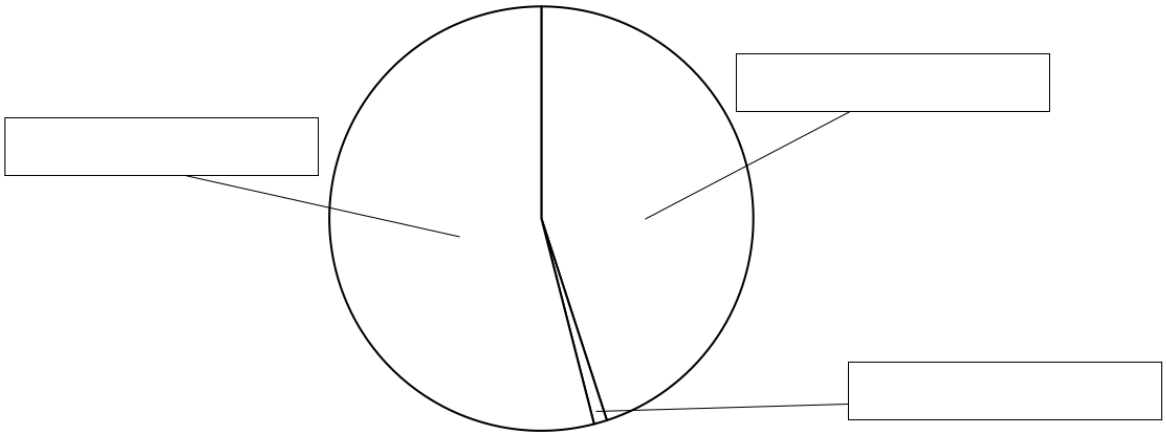
- It also fights against _____ and helps heal _____, so we can stay healthy

What is blood made of?

- There are 4 main components (parts) of blood:
  - _____
  - _____
  - _____
  - _____

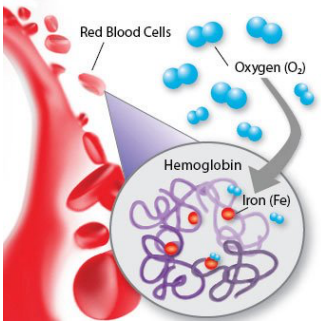


What is blood made of? Percentages



What do Read Blood Cells do?

- Red blood cells (Erythrocytes) – The _____ cells in our blood; they are produced in the _____ and contain a protein called _____ that carries _____ to our cells.

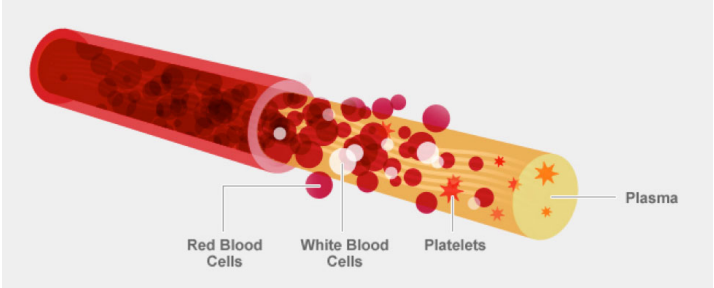


What do White blood cells do?

- White blood cells (Leukocytes) – They are part of the _____ and destroy infectious agents called _____.

What does Plasma do?

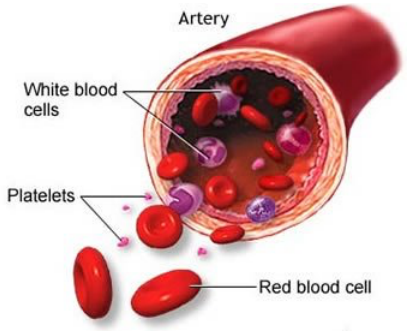
- Plasma – This is the _____ of blood that contains electrolytes, _____ and vitamins, hormones, _____, and _____ such as antibodies to fight infection.



Name: _____ Per: _____ Date: _____

What do Platelets do?

- Platelets (Thrombocytes) – The _____ that are carried in the plasma; they clot together in a process called _____ to seal a wound and prevent a loss of blood.

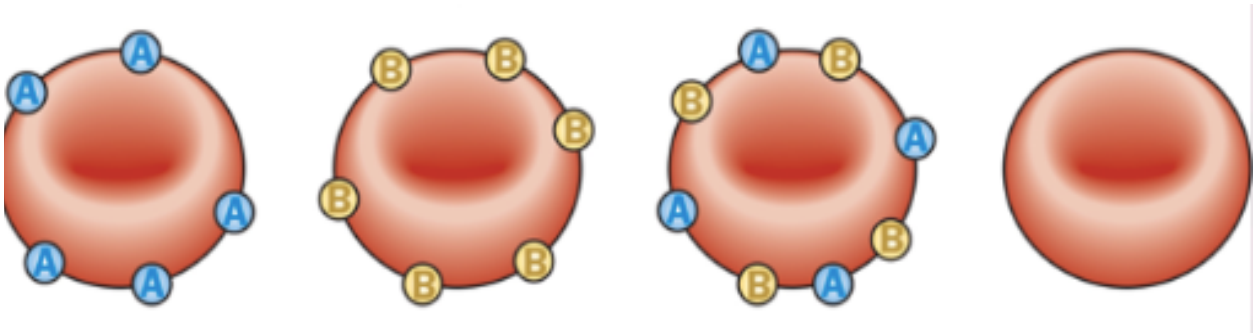


YOYO: Fill in the chart below to review yesterday's material.

Components of Blood	
Red Blood Cells	
	Part of the immune system that helps fight off invaders called pathogens
	The liquid part of the blood that carries water, proteins, waste etc.
Platelets	

How did I get my blood type?

- Your blood type is established _____, by _____ _____inherited from your parents.
- You inherit one gene from your _____ and one from your _____.
- These genes determine your blood type by causing proteins called _____ to exist on the _____ of all of your _____ blood cells.



Name: _____ Per: _____ Date: _____

So what does it mean to have a different blood type?

- Different blood types have different proteins on the surface of the RBCs called _____
- In addition, there are _____ in the blood to fight against the other blood types

Type	Antigen	Antibodies
A		
B		
AB		
O		

	Type A	Type B	Type AB	Type O
Antigen (on RBC)				
Antibody (in plasma)				

Name: _____ Per: _____ Date: _____

Quick Genetics Vocabulary Review

- _____: the genetic makeup of an organism (what the genes are doing)
- _____: the result of the genotype (what you see), in the case of blood, the phenotype
- _____: having two different alleles (ex. Bb)
- _____: having two of the same alleles (ex. BB or bb)
- _____: the "stronger" gene that you see, written has a capital letter
- _____: the "weaker" gene that is hidden if a dominant allele is present, written as a lowercase letter

Quick Genetics Review

- Alleles: B and b
- Heterozygous genotype: _____
- Homozygous recessive genotype: _____
- Homozygous dominant genotype: _____

Quick Genetics Review: Punnett Square

- Punnett Square are used to determine the probability of a specific genotype occurring
  - B is the allele for brown eyes
  - b is the allele for blue eyes
  - Brown is _____
  - Blue is _____
  - Genotype: _____
  - Phenotype: _____

		Father	
		B	b
Mother	B		
	b		

Blood Genetics

- Each individual has _____ of a gene, one copy from their biological mother, and one from their biological father.
- When it comes to blood, a parent can pass on one of the following genes:
  - _____
- There are three different versions of the gene (alleles), so how many possible combinations are there?

Name: _____ Per: _____ Date: _____

The Different Genotypes of Blood Types

Genotype	**Phenotype (blood type)**

Blood Punnett Square

- Mother's Blood Type: _____
- Father's Blood Type: _____
- Child #1's Blood Type: _____
- Child #2's Blood Type: _____
- Child #3's Blood Type: _____
- Child #4's Blood Type: _____

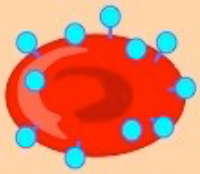
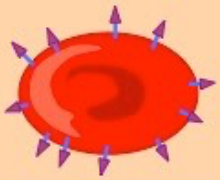
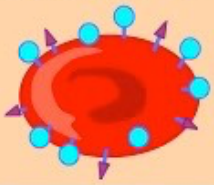
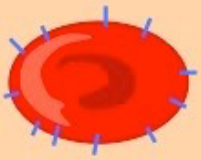
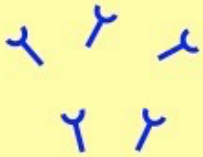
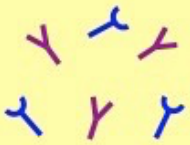
		Father	
		I^A	I^B
Mother	I^A		
	i		

YOYO:

- What are all the possible genotypes and blood types of the offspring if the mother has Type A and the father has Type O?

Name: _____ Per: _____ Date: _____

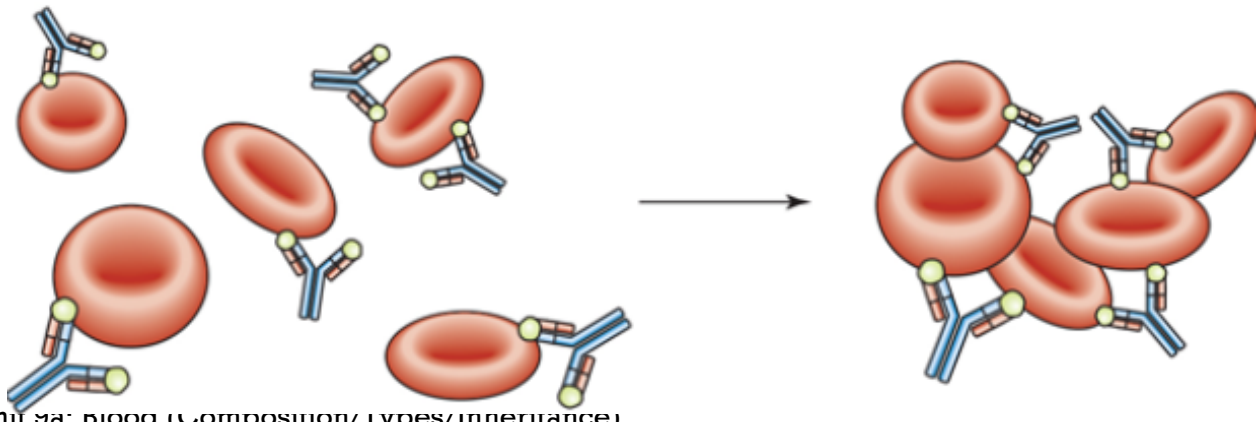
Blood Type Review

	Type A	Type B	Type AB	Type O
Antigen (on RBC)	Antigen A 	Antigen B 	Antigens A + B 	Neither A or B 
Antibody (in plasma)	Anti-B Antibody 	Anti-A Antibody 	Neither Antibody	Both Antibodies 

Blood Transfusions

- In medical emergencies, patients can receive blood that has been donated by strangers.
- **Question:** If patient A has Type A blood, their RBCs contain the A antigens, and the anti-B antibodies. If Patient A receives Type B blood, what will happen?

- Before a patient receives blood, doctors must make sure they are giving the correct type of blood.
- Using the wrong type of blood can result in _____ due to the _____ (clotting).
- The _____ will attack the foreign blood type



Name: _____ Per: _____ Date: _____

Who Can Receive from Who: Basic Blood Types

Blood Type	Can Receive From	Can Donate To
A		
B		
AB		
O		

- The Universal Donor is _____
- The Universal Recipient is _____

What are Rh Factors

- Scientists sometimes study _____ to learn more about the human anatomy because there are certain similarities between the two species.
- While studying Rhesus monkeys, a certain _____ was discovered.
- This protein is also present in the blood of _____ _____. Other people, however, _____ have the protein.
- The presence of the protein, or lack of it, is referred to as the Rh (for _____) factor.
- If your blood does contain the protein, your blood is said to be Rh positive **(____)**
- If your blood does not contain the protein, your blood is said to be Rh negative **(____)**
- _____
- _____

Blood Types with Rh Factors

- Taking Rh factors into account, the blood types are: _____
- On many popular medical drams, like Grey's Anatomy, a doctor will frantically yell for "O-neg" in the operating room. Why?

Name: _____ Per: _____ Date: _____

Red Blood Cell Compatibility Table

Recipient	**Donor**							
	O-	O+	A-	A+	B-	B+	AB-	AB-
O-								
O+								
A-								
A+								
B-								
B+								
AB-								
AB+								