

**Unit 9: Blood: (Composition/Types/Inheritance/Spatter Analysis)  
Review Sheet**

# The 3 different kinds of exam takers...



**Date:**

- Wednesday, March 7, 2018

**Format:**

- **Part 1: Vocabulary** (5 matching questions each worth 4 points)
  - (20 points total)
- **Part 2: Multiple Choice** (15 multiple choice questions straight from the notes each worth 4 points)
  - (60 points total)
- **Part 3: Clump/Not Clump: Blood Typing** (4 true/false style questions on whether or not a blood sample will clump worth 1 point each)
  - (4 points total)
- **Part 4: Punnet Square** (Fill out the Punnet Square to properly show how blood type is inherited)
  - (11 points total)
- **Part 5: Draw-a-Cell** (Draw the correct antigens for a specific blood type)
  - (1 point total)

Name: \_\_\_\_\_ KEY \_\_\_\_\_ Per: \_\_\_\_\_ Date: \_\_\_\_\_

### Vocabulary Review

Word	Definition
RBC	The most abundant cell in the blood which carries oxygen to all the cells in the body
WBC	Part of the immune system that helps fight off invaders called pathogens
plasma	The liquid part of the blood that carries water, proteins, waste, etc.
Platelets	The part of the blood that helps with the clotting to prevent major blood loss
antigens	Proteins on the surface of the RBC that determine the blood type of an individual
antibodies	Proteins in the blood that are present to fight off invaders
genotype	The genetic makeup of an organism (What the genes are doing)
Phenotype	The result of the genotype (what you see), in the case of blood, blood type is the phenotype
heterozygous	Having two different alleles (ex. Bb)
homozygous	Having two of the same alleles (ex. BB or bb)
Rh Factor	A protein found in monkeys and in some humans (Rh+ have the protein, Rh- does not have the protein)
artery	Blood vessels that bring oxygenated blood away from the heart to the body
vein	Blood vessels that bring deoxygenated blood toward the heart from the body
capillary	A grouping of blood stains that can help determine how they got there
satellite	Small secondary droplets around the main parent drop
lines of convergence	Can help pinpoint the location of the blood source
point of origin	Where the blood came from
arterial gush	Results from a damaged artery producing large drops that run downward due to their large volume
Smear	Large volumes of blood that can sometimes create recognizable mirror images on the previously unstained surface
cast-off	The spatter pattern created when a blood covered instrument is raised or swung backward
luminol	Used to determine if a substance such as blood is at a crime scene, reacts with both old or new blood, but destroys it
Kastle-Meyer Test	Use to determine if a blood stain found is actually blood
ELISA test	Use to determine if the blood found is the blood of a human

Name: KEY Per: \_\_\_\_\_ Date: \_\_\_\_\_

**Blood Type (Antigens/Antibodies)**

Blood Type	Antigen(s) Present	Antibodies Present
A	A	B
B	<del>A</del> B	A
AB	A & B	neither A nor B
O	Neither A nor B	A & B

**Genotypes/Blood Types**

Genotypes	Phenotypes (Blood Type)
$I^A i$	Type A
$I^A I^A$	
$I^B i$	Type B
$I^B I^B$	
ii	Type O
$I^A I^B$	AB

**Blood Donations**

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

Name: \_\_\_\_\_

KEY

Per: \_\_\_\_\_

Date: \_\_\_\_\_

**Blood Type Punnet Squares**

1. Fill in the Punnet Square below and determine the blood type of each individual.

- a. Mother's Blood Type: A
- b. Father's Blood Type: AB
- c. Child 1's Blood Type: A
- d. Child 2's Blood Type: AB
- e. Child 3's Blood Type: A
- f. Child 4's Blood Type: B

		Father	
		I <sup>A</sup>	I <sup>B</sup>
Mother	I <sup>A</sup>	Child #1 I <sup>A</sup> I <sup>A</sup>	Child #2 I <sup>A</sup> I <sup>B</sup>
	i	Child #3 I <sup>A</sup> i	Child #4 I <sup>B</sup> i

2. Fill in the Punnet Square below and determine the blood type of each individual.

- a. Mother's Blood Type: O
- b. Father's Blood Type: AB
- c. Child 1's Blood Type: B
- d. Child 2's Blood Type: B
- e. Child 3's Blood Type: B
- f. Child 4's Blood Type: B

		Father	
		I <sup>A</sup> I <sup>B</sup>	I <sup>A</sup> I <sup>B</sup>
Mother	i	Child #1 I <sup>B</sup> i	Child #2 I <sup>B</sup> i
	i	Child #3 I <sup>B</sup> i	Child #4 I <sup>B</sup> i

3. Fill in the Punnet Square below and determine the blood type of each individual.

- a. Mother's Blood Type: AB
- b. Father's Blood Type: AB
- c. Child 1's Blood Type: A
- d. Child 2's Blood Type: AB
- e. Child 3's Blood Type: AB
- f. Child 4's Blood Type: B

		Father	
		I <sup>A</sup>	I <sup>B</sup>
Mother	I <sup>A</sup>	Child #1 I <sup>A</sup> I <sup>A</sup>	Child #2 I <sup>A</sup> I <sup>B</sup>
	I <sup>B</sup>	Child #3 I <sup>A</sup> I <sup>B</sup>	Child #4 I <sup>B</sup> I <sup>B</sup>

Name: \_\_\_\_\_ Per: \_\_\_\_\_ Date: \_\_\_\_\_

4. The mother has Type O blood and the father is heterozygous for Type B. Fill out the Punnett Square below and determine the blood types for each of the children.

- a. Child 1's Blood Type: B
- b. Child 2's Blood Type: O
- c. Child 3's Blood Type: B
- d. Child 4's Blood Type: O

#4		Father	
		$I^B$	$i$
Mother	$i$	Child #1 $I^B i$	Child #2 $i i$
	$i$	Child #3 $I^B i$	Child #4 $i i$

5. The mother is homozygous for Type B blood and the father is heterozygous for Type A. Fill out the Punnett Square below and determine the blood types for each of the children.

- a. Child 1's Blood Type: AB
- b. Child 2's Blood Type: ~~AB~~ B
- c. Child 3's Blood Type: AB
- d. Child 4's Blood Type: B

#5		Father	
		$I^A$	$i$
Mother	$I^B$	Child #1 $I^A I^B$	Child #2 $I^B i$
	$I^B$	Child #3 $I^A I^B$	Child #4 $I^B i$

**Blood Typing: Clump vs. Not Clump**

- 1. Anti-Rh is added to AB+  a. clump  b. not clump
- 2. Anti-A is added to B-  a. clump  b. not clump
- 3. Anti-A is added to AB-  a. clump  b. not clump
- 4. Anti-B is added to O+  a. clump  b. not clump

*attaches Rh  
attaches A*

*+ = has Rh  
- = no Rh*

*anti attacks the thing in its name if it attacks = clump*

**Multiple Choice Practice**

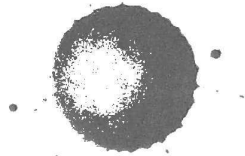
- 1. Which of the following genotypes shows an individual heterozygous for Type A?  a.  $I^A i$   b.  $I^A I^B$   c.  $I^A I^A$   d.  $ii$  *no attack = no clump*
- 2. The picture below shows a red blood cell with antigens. What is the blood type of this individual?  a. Type A  b. Type B  c. Either Type A or B  d. Type AB (has 2 different shapes)  e. Type O (no antigens)



*BC there is no key, you don't know if it's A or B so it could be either.*

3. Blood type evidence is considered to be
- Class evidence because it can pinpoint a suspect
  - Class evidence because it can rule out a suspect
  - Individual evidence because it can pinpoint a suspect
  - ~~Class~~ evidence because it can rule out a suspect
4. Which of the following must be considered during blood transfusions to ensure the correct blood is given?
- The antigen present
  - The antibodies present
  - Rh factor
  - A, B, and C

5. The blood spatter shown to the right is classified as \_\_\_\_\_.
- Blood trails
  - A smear
  - Passive drops
  - A wipe



6. What is the relationship between the velocity of impact and the size of the blood spatter?
- The higher the velocity, the larger the blood drop
  - The higher the velocity, the smaller the blood drop
  - The lower the velocity, the smaller the drop
  - None of the above
7. Which of the following is true about luminol?
- It reacts with both old and new blood
  - It determines if a sample is actually blood
  - It damages the sample, so it cannot be used for further analysis
  - Both a and c
  - All of the above

8. Which test is used to determine if a blood sample is human?
- Luminol
  - Kastle-Meyer
  - ELISA
  - A, B, and C

9. Based on the picture below, what direction is the blood traveling?
- From the left to the right
  - From the right to the left
  - From the top to the bottom
  - From the bottom to the top



10. Which statement is true based on the images to the right?
- The blood drops fell at the same angle
  - Blood drop A fell at a larger angle
  - Blood drop B fell at a larger angle
  - It is impossible to determine with the information given



Drop A



Drop B