

OAKLAND CUSD #5

**ANATOMY**  
**APRIL 20-24, 2020**

DEBRA WELCH

# Week of April 20-24, 2020

## High School Science

### Debra Welch

Hello students! I hope all of you are staying healthy. I just want everyone to know that I am thinking you and miss having school as normal. Remember to keep your immune systems strong! Basic directions are: You need to complete one lesson a week for only the class you were currently enrolled in and choose from the 3 choices. Choices 1 & 2 are for review of material we have already covered this year. I will start at the beginning and go through the year's material. Choice #3 will always be new work using your textbook or other handouts I include. I will make every effort to keep your work simple to do, considering that we are not learning together in the classroom. Your work should be turned in as a hard (paper) copy to the office or through email in a word or google document. My email is: [debra.welch@oakland5.org](mailto:debra.welch@oakland5.org). Please be sure all work has your name! If you have not turned in the assignment by the following Monday, I will need to email your parents and/or place a phone call home. Please be diligent to turn work in on time. I suggest you set up a schedule just as if you were at school and allow for the normal time period. Most assignments I send you will take less time than our normal 40 minutes. Comments will be made on paper copies and returned to you. If you send in homework answers as an email I will reply to your email and give my comments/reflections of your work. I will be supplying you with the necessary notes or you will need to use your book to find the answers. If you have any questions feel free to email me and I will get back to you by email during my office hours. If you can't email feel free to call the office and leave me a message. Good Luck and stay healthy!

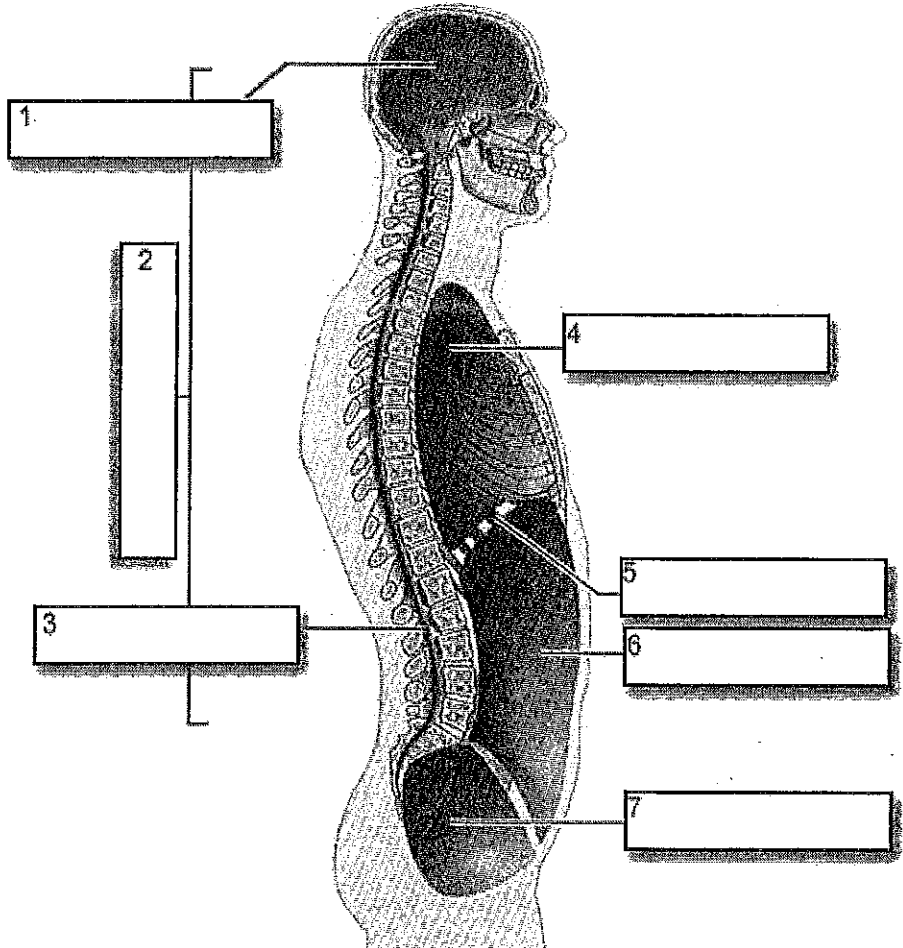
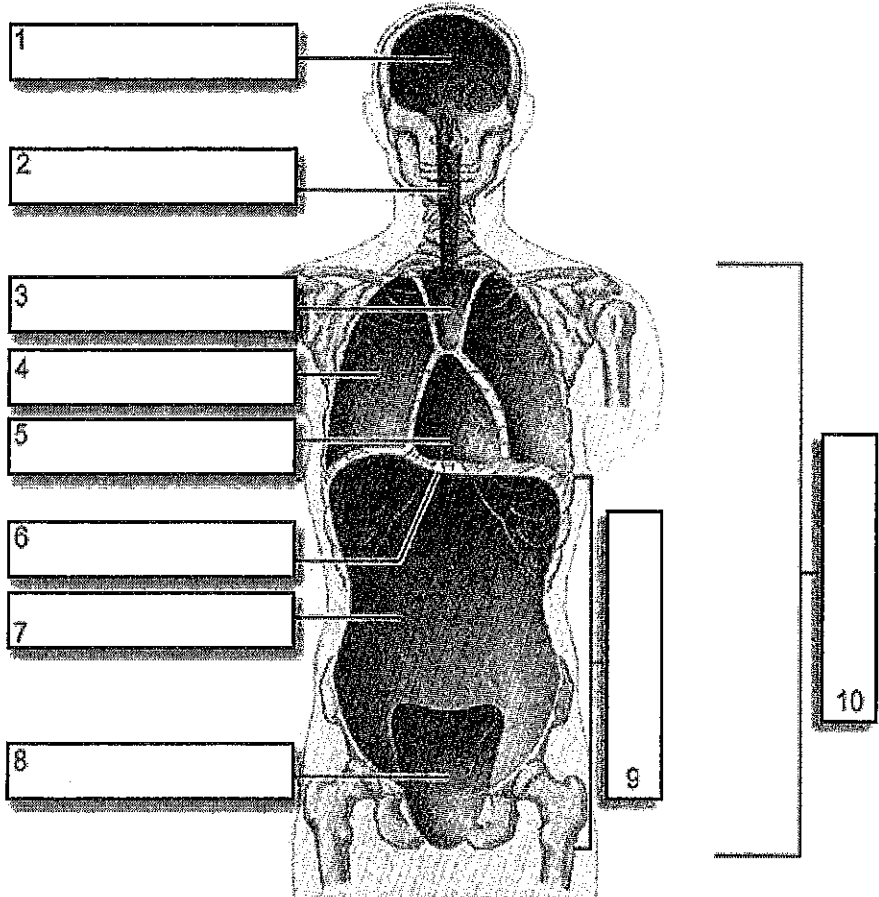
Anatomy: for those of you who wanted to continue learning throughout the body systems I will be including notes and sending you powerpoints to use with Choice #3. If you plan to go into a medical field I advise you to go ahead and complete the Enrichment on the body systems we could not study due to school closure.

Lesson Choices on next page:

Class	Choice 1	Choice 2	Choice 3 (Enrichment)
Biology	<p><b>Worksheet p1</b> Biology the Science of Life, questions 1-20</p> <p>Use text &amp; notes I provided to you last week on the "Nature of Life"</p>	<p>Biology for Everyday: Characteristics of Living Things p1: Fill out both columns on the chart: a definition and example.</p> <p>(There are 12 &amp; #1 is done for you).</p>	<p>READ the powerpoint notes on Viruses &amp; do the <u>SG 18-2 p16</u>. Then do <u>colorsheet p32</u> Viral Replication. (Do both).</p>
Anatomy	<p><u>Re:view</u> Body Cavities Labeling worksheet. Look up using your text or notes and fill out the different body cavities on the worksheet.</p> <p><i>DO Back also Body Regions</i></p>	<p><u>Review:</u> Body Systems Graphic Organizer Fill out the missing boxes on the sheet. These terms either describe a function or list a structure (organ).</p> <p>Refer to <i>word bank</i> at bottom of page!</p>	<p><u>New chapter: Blood</u> <b>**View Video- "Blood"</b> by Khan Academy for "extra help". I am including the entire Act #1 on Blood. Start on pg3 and complete all of it. Do not do #15 on page 8. I have emailed to all students the powerpoint notes for this packet. <i>I am including packets like this for those who want to continue their education in the rest of the body systems we could not cover due to COV-19.</i></p>

# Body Cavities Labeling

Name: \_\_\_\_\_ 4/20-24

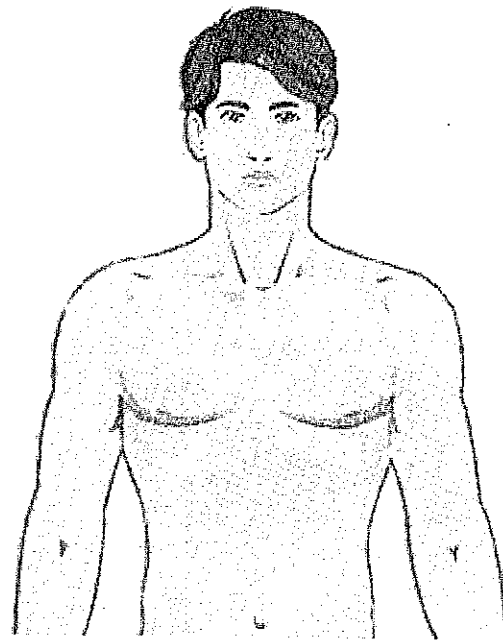


Name: \_\_\_\_\_

4/20-24

## Match the Body Region

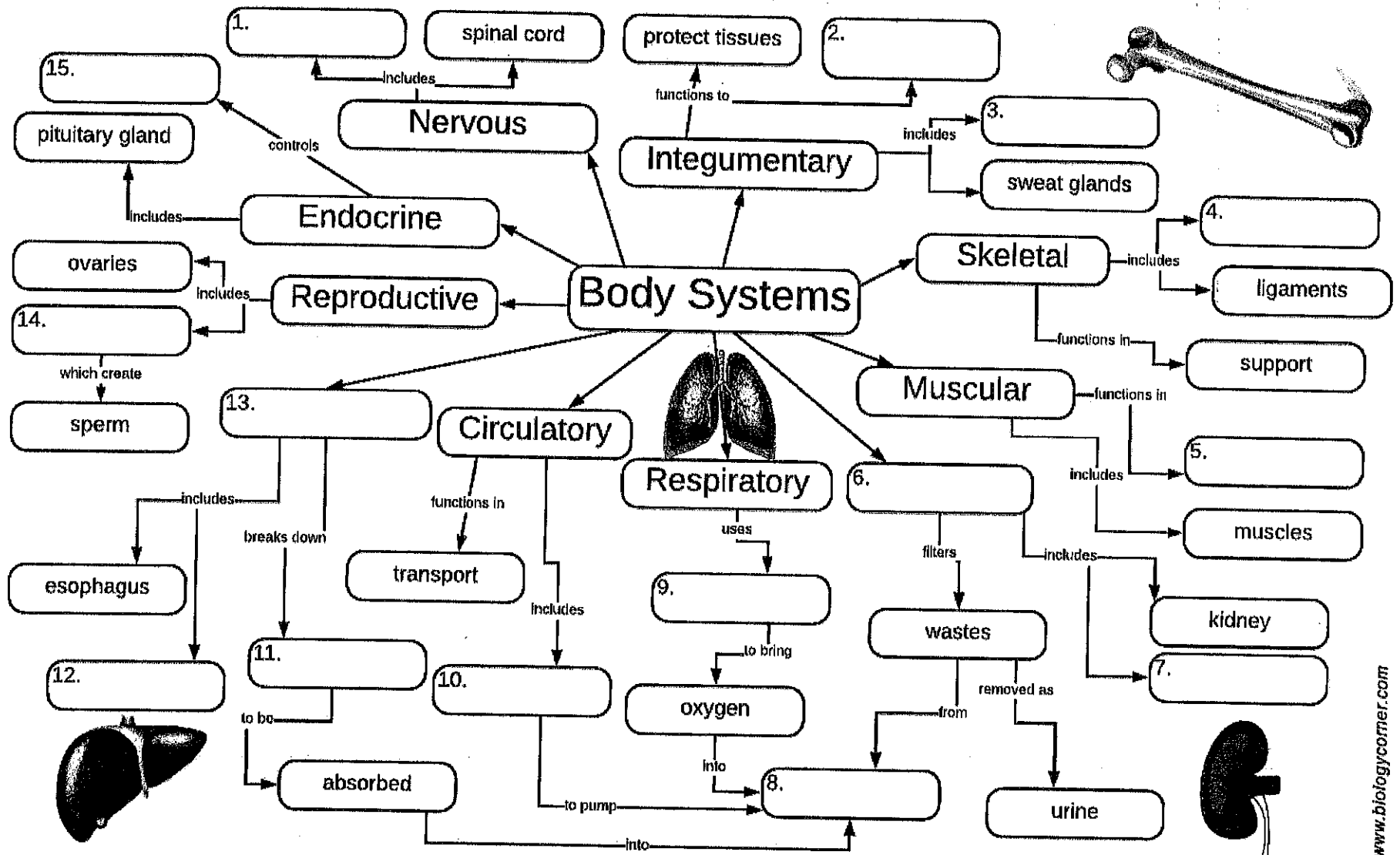
- |                      |                   |
|----------------------|-------------------|
| ___ 1. Cephalic      | a. arm            |
| ___ 2. Buccal        | b. shin           |
| ___ 3. Cervical      | c. wrist          |
| ___ 4. Thoracic      | d. head           |
| ___ 5. Coxal         | e. armpit         |
| ___ 6. Crural        | f. backside       |
| ___ 7. Tarsal        | g. chest          |
| ___ 8. Pedal         | h. lower back     |
| ___ 9. Axillary      | i. thigh          |
| ___ 10. Brachial     | j. cheek          |
| ___ 11. Digital      | k. forearm        |
| ___ 12. Carpal       | m. buttocks       |
| ___ 13. Dorsal       | n. foot           |
| ___ 14. Lumbar       | o. hip            |
| ___ 15. Inguinal     | p. eye            |
| ___ 16. Femoral      | q. ankle          |
| ___ 17. Antebrachial | r. kneec          |
| ___ 18. Gluteal      | s. neck           |
| ___ 19. Orbital      | t. fingers / toes |
| ___ 20. Patellar     | v. groin          |



Anat - D Welch choice 2  
4/20-24

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

### Body Systems Graphic Organizer



Word Bank: bones | urinary | testes | digestive | regulate temperature | lungs | heart | food | hormones | movement | skin | bladder | blood | brain | stomach

Use powerpoint  
I emailed to you.

4 of 15

Anat - D. Welder  
Choice 3

4/20-24

CARDIOVASCULAR SYSTEM  
ACTIVITY #1

NAME \_\_\_\_\_

DATE \_\_\_\_\_ HOUR \_\_\_\_\_

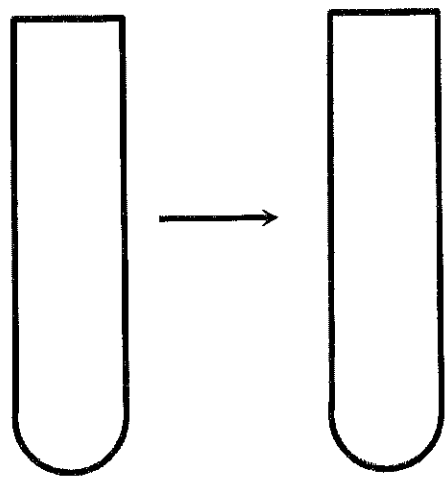
## BLOOD

### OBJECTIVES:

- List the major functions and important components of blood. (p. 334)
- List, describe, and give the functions of the components of plasma. (p. 336)
- List, describe, and give the functions of each formed element in blood. (pp. 336 - 347)
- Describe the mechanisms that reduce blood loss after an injury. (pp. 348 - 349)

### MAJOR FUNCTIONS OF BLOOD


**COMPOSITION OF BLOOD**



<p>Two red blood cells are shown. One is a biconcave disc, and the other is a smaller, more elongated form. A horizontal line is drawn below the cells.</p>	
<p>Two white blood cells are shown. The one on the left has a multi-lobed nucleus, and the one on the right has a large, round nucleus. A horizontal line is drawn below the cells.</p>	
<p>A cluster of small, irregularly shaped platelets is shown. A horizontal line is drawn below the cluster.</p>	



**BLOOD FORMED ELEMENTS IDENTIFICATION AND CHARACTERISTICS****PART I: ERYTHROCYTES**

Erythrocytes, or red blood cells, range in size from 5 to 10  $\mu\text{m}$  in diameter. The color of these cells varies from a salmon red color to pale pink, depending on the effectiveness of the stain. They have a distinctive biconcave disk shape and appear paler in the center than at the edge.

Erythrocytes differ from the other blood cells because they lack a nucleus when mature and circulating in the blood. As a result, they are unable to reproduce and have a limited life span of 80 to 120 days, after which they begin to fragment and are engulfed and destroyed by macrophages. The heme group in the hemoglobin molecule is converted into bilirubin a major component of bile.

Before birth, red blood cells are produced in the yolk sac, liver, and spleen. After birth, they are produced in the red marrow at the proximal ends of long bones and in flat bones.

1. Locate the erythrocytes in Slide #1. Locate the erythrocytes in each of the other slides.

Describe the shape of the erythrocytes. \_\_\_\_\_

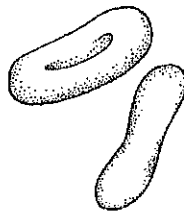
Describe the color of the erythrocytes. \_\_\_\_\_

Can you see a nucleus in the erythrocytes? \_\_\_\_\_

How does the number of erythrocytes in each slide compare to the number of white blood cells?

\_\_\_\_\_

2. Color the erythrocytes pictured at the below. Since the erythrocytes appear red or pale red under the microscope, color them red or pale red.



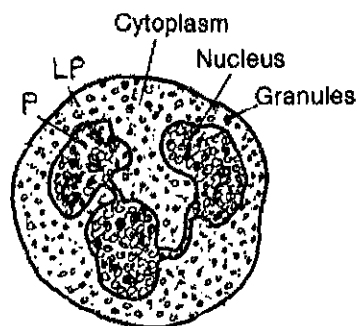
## PART II: LEUKOCYTES

Leukocytes, or white blood cells, are nucleated cells that are much less numerous than the red blood cells. Their numbers range from 4,000 to 11,000 per cubic milliliter. Basically white blood cells are protective, pathogen-destroying cells that are transported to all parts of the body in the blood or lymph. Important to their protective function is their ability to move in and out of blood vessels, and to wander through body tissues to reach sites of inflammation or tissue destruction.

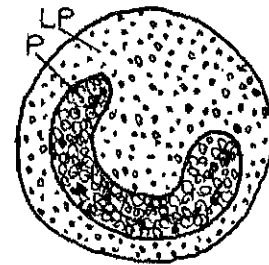
Leukocytes are classified into two major groups, depending on whether or not they contain granules in their cytoplasm. **Granulocytes** contain cytoplasmic granules. The granulocytes are further classified based on how their cytoplasmic granules stain with Wright's stain and the structure of the nucleus. The second group of leukocytes, the **agranulocytes**, contains no observable cytoplasmic granules. The agranulocytes are found in the blood stream but are more abundant in lymphoid tissue and lymph.

3. One type of granulocyte, the **neutrophils**, are the most abundant of the leukocytes (50% to 70% of the leukocyte population.) Neutrophils are active phagocytes that engulf and destroy pathogens or debris in tissues. The cytoplasmic granules contain cytotoxic enzymes, chemicals, and enzymes that digest the microorganisms. The number of neutrophils increases exponentially during acute infections. The drawings below represent neutrophils. Color the drawings using the following colors:

LP = light purple  
P = purple



SEGMENTED (MATURE)



BAND (IMMATURE)

4. The nuclei in neutrophils consist of 3 to 7 lobes and their cytoplasm stains light purple. The granules in the cytoplasm are fine and generally indistinguishable. Examine the neutrophils in Slide #2.

Describe the shape and color of the nucleus.

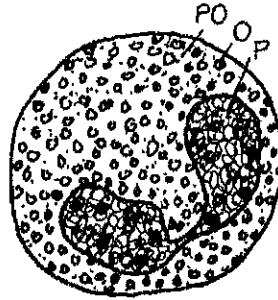
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Describe the texture and color of the cytoplasm.

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5. A second type of granulocyte, the **eosinophils**, represents 1% to 4% of the leukocyte population. Eosinophils attack antibody-labeled materials through the release of cytotoxic enzymes and/or through phagocytosis. The drawing below represents an eosinophil. Color the drawing using the following colors:

**PO** = pale orange  
**O** = orange  
**P** = purple



6. The nucleus in an eosinophil generally forms a figure-8 shape or is bilobed. The large cytoplasmic granules stain orange to red orange with Wright's stain. Examine the eosinophil in Slide #3.

Describe the shape and color of the nucleus.

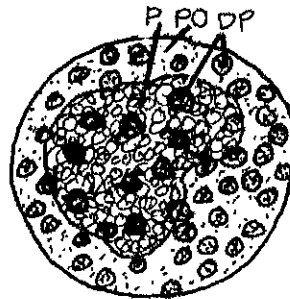
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Describe the texture and color of the cytoplasm.

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7. The third type of granulocyte, the **basophils**, is the least abundant leukocyte type representing less than 1% of the population. Basophils are involved in allergic reactions and inflammation. They enter damaged tissues and release histamine and other chemicals that reduce inflammation. The drawing below represents a basophil. Color the drawing using the following colors:

**P** = purple  
**PO** = pale orange  
**DP** = dark purple



8. The nuclei in basophils are large, U- or S-shaped with two or more indentations. The cytoplasm contains coarse granules that stain dark purple. These coarse granules make it difficult to see the nucleus. Examine the basophil in Slide #4.

Describe the shape and color of the nucleus.

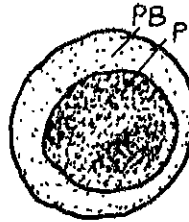
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Describe the texture and color of the cytoplasm.

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9. One type of agranulocyte, the **lymphocytes**, is the smallest of the leukocytes. Lymphocytes are about the size of a red blood cell. In general the lymphocytes are involved in the immune response. There are two types of lymphocytes – B cells and T cells. B cells form plasma cells when activated. Plasma cells produce antibodies in response to exposure to a foreign substance (antigen). T cells regulate the cellular immune response, secrete chemicals that destroy foreign material and organism, and activate B cells. Lymphocytes represent 20% to 45% of the leukocyte population. The drawing below represents a lymphocyte. Color the drawing using the following colors:

**PB = Pale Blue**  
**P = Purple**



10. The dark blue-purple (sometimes pink) staining nucleus is generally spherical or slightly indented and accounts for most of the cell mass. The cytoplasm appears as a thin blue rim around the nucleus. Examine the lymphocyte in Slide #5.

Describe the shape and color of the nucleus.

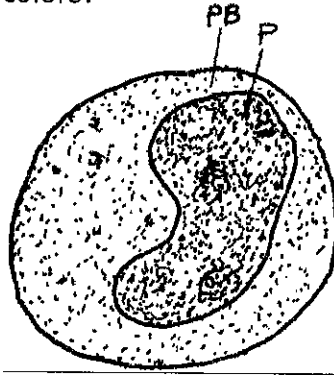
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Describe the texture and color of the cytoplasm.

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11. The other type of agranulocyte, the **monocytes**, is the largest of the leukocytes. Monocytes are about twice as large as the red blood cells. Monocytes are mobile phagocytes that enter tissues to engulf pathogens or debris. Monocytes that leave the blood stream and enlarge are known as macrophages. The drawing at the right represents a monocyte. Color the drawing using the following colors:

PB = pale blue  
P = purple



12. The nucleus stains dark blue (sometimes pink) and is generally kidney shaped. The abundant cytoplasm stains gray-blue. Examine the monocyte in Slide #6.

Describe the shape and color of the nucleus.

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Describe the texture and color of the cytoplasm.

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### PART III: PLATELETS

13. Platelets are cell fragments of large multinucleated cells formed in the bone marrow. They appear as darkly staining, irregularly shaped bodies interspersed among the blood cells. The normal platelet count in blood ranges from 250,000 to 500,000 per cubic millimeter (or microliter,  $\mu\text{L}$ ). Platelets are instrumental in the clotting process that occurs when blood vessels rupture. After an injury to a blood vessel, platelets clump together and stick to vessel walls forming a platelet plug. This clumping together initiates the coagulation phase of hemostasis (reduction of blood loss.) Examine the platelets in Slide #7. In general, how does the size of platelets compare to the size of the erythrocytes?

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**PART IV: SUMMARY**

14. Listed below are the characteristics used to identify each of the formed elements in blood. Match the formed element with the correct description. Use the key below to indicate you answers.

- |     |              |    |             |
|-----|--------------|----|-------------|
| ER. | Erythrocytes | P. | Platelets   |
| N.  | Neutrophils  | B. | Basophils   |
| E.  | Eosinophils  | L. | Lymphocytes |
| M.  | Monocytes    |    |             |

\_\_\_\_\_ Cells are red or pink in color, lack a nucleus, and have a biconcave shape that makes them paler in the center than at the edge

\_\_\_\_\_ Cell fragments (pieces of cells); very small

\_\_\_\_\_ Cytoplasm is so full of granules that the nucleus is difficult to see

\_\_\_\_\_ Nucleus, consisting of several lobes, stains dark purple or blue; cytoplasm stains light purple or blue

\_\_\_\_\_ Nucleus, consisting of 2 lobes, stains dark purple or blue; cytoplasm stains red or orange

\_\_\_\_\_ Nucleus stains dark purple and takes up most of the space within the cell; the cytoplasm appears as a thin blue rim around nucleus

\_\_\_\_\_ Big cell (about twice the size of a red blood cell); nucleus stains dark purple or blue; the abundant cytoplasm stains light blue.

15. What type of formed element (erythrocyte, neutrophil, eosinophil, basophil, lymphocyte, monocyte, or platelet) is represented by each of the following?

Letter A in Slide #8: \_\_\_\_\_

Letter B in Slide #8: \_\_\_\_\_

Letter C in Slide #9: \_\_\_\_\_

Letter D in Slide #10: \_\_\_\_\_

Letter E in Slide #10: \_\_\_\_\_

Letter F in Slide #10: \_\_\_\_\_

Letter G in Slide #11: \_\_\_\_\_

Letter H in Slide #11: \_\_\_\_\_

Letter I in Slide #11: \_\_\_\_\_

Letter J in Slide #12: \_\_\_\_\_

**Part V: Questions**

16. Use the key below to identify the type of white blood cell described. Use the key below to indicate your answers.

- |    |             |    |             |
|----|-------------|----|-------------|
| N. | Neutrophils | M. | Monocytes   |
| B. | Basophils   | L. | Lymphocytes |
| E. | Eosinophils |    |             |

\_\_\_\_\_ Granulocytes

\_\_\_\_\_ Agranulocytes

\_\_\_\_\_ Active phagocytes that engulf and destroy pathogens and debris in tissues; release cytotoxic enzymes and chemicals

\_\_\_\_\_ Attack antibody-labeled materials through the release of cytotoxic chemicals and/or through Phagocytosis

\_\_\_\_\_ Enter damaged tissues and release histamine and other chemicals that reduce inflammation

\_\_\_\_\_ Mobile phagocytes that enter tissues to engulf pathogens or debris; may exit circulation, enlarge, and become macrophages

\_\_\_\_\_ Form B cells and T cells that are involved in the immune response

You will need to use your textbook, pages 334 – 350, to answer the following questions.

17. What materials are transported by blood?

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

18. Why are red blood cells red?

\_\_\_\_\_

How does the color of oxygenated blood compare to that of deoxygenated?

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

19. Identify the plasma protein described in each of the following statements. Use the key below to indicate your answers.

- |               |                         |
|---------------|-------------------------|
| A. Albumins   | G. Globulins            |
| F. Fibrinogen | RP. Regulatory proteins |

- \_\_\_\_\_ Enzymes, clotting factors, and hormones
- \_\_\_\_\_ Transport ions, hormones, and lipids; involved in immune function (antibodies)
- \_\_\_\_\_ Essential component of clotting system; converted into insoluble fibrin during clot formation
- \_\_\_\_\_ Major contributors to osmotic balance in blood; transport lipids and steroid proteins

20. Identify the blood component described below. Use the key provided to indicate your answers.

- |               |                 |
|---------------|-----------------|
| A. Plasma     | B. Erythrocytes |
| C. Leukocytes | D. Platelets    |

- \_\_\_\_\_ Liquid portion of blood
- \_\_\_\_\_ Transports glucose, amino acids, lipids
- \_\_\_\_\_ Red blood cells
- \_\_\_\_\_ Transports waste products
- \_\_\_\_\_ White blood cells
- \_\_\_\_\_ Yellow liquid
- \_\_\_\_\_ Lack nuclei
- \_\_\_\_\_ Biconcave shape
- \_\_\_\_\_ Have nuclei
- \_\_\_\_\_ Transports dissolved materials
- \_\_\_\_\_ Destroy microorganisms
- \_\_\_\_\_ Transports most of the oxygen
- \_\_\_\_\_ Remove dead or damaged cells & tissues
- \_\_\_\_\_ Contains hemoglobin



- \_\_\_\_\_ 46% to 63% of blood
- \_\_\_\_\_ 37% to 54% blood
- \_\_\_\_\_ Transports most of the carbon dioxide
- \_\_\_\_\_ Involved in blood clotting
- \_\_\_\_\_ Cell fragments
- \_\_\_\_\_ Neutrophils
- \_\_\_\_\_ Eosinophils
- \_\_\_\_\_ Basophils
- \_\_\_\_\_ Monocytes
- \_\_\_\_\_ Lymphocytes

21. Read the section on Hemolytic Disease of the Newborn on page 343 and answer the questions that follow.

Does an Rh-negative individual normally contain anti-Rh antibodies?

\_\_\_\_\_

An Rh-negative individual would produce anti-Rh antibodies after:

\_\_\_\_\_

Under what circumstances would an Rh-negative individual develop anti-Rh antibodies?

\_\_\_\_\_

Hemolytic disease of the newborn affects an Rh-\_\_\_\_\_ baby  
born to an Rh-\_\_\_\_\_ mother.

Why doesn't the first Rh-positive baby born to an Rh-negative mother develop by hemolytic disease of the newborn?

\_\_\_\_\_

What are the effects of hemolytic disease of the newborn?

\_\_\_\_\_

Why are the effects on the second child much more severe than the effects on the first?

\_\_\_\_\_

22. Read the section on Hemostasis, pp. 348 – 349, and answer the questions that follow.

What is hemostasis? \_\_\_\_\_

\_\_\_\_\_

Hemostasis involves 3 steps. Match the description/event with the correct step. Use the key below to indicate your answers.

- 1. Step 1
- 2. Step 2
- 3. Step 3

\_\_\_\_\_ Vascular phase

\_\_\_\_\_ Platelet phase

\_\_\_\_\_ Coagulation phase

\_\_\_\_\_ Contraction of the blood vessel decreasing the vessel's diameter

\_\_\_\_\_ Produces a local vascular spasm that can slow or stop blood loss

\_\_\_\_\_ Membranes of the endothelial cells become sticky

\_\_\_\_\_ Platelets attach to exposed endothelial surfaces

\_\_\_\_\_ Platelets form a mass that may plug the hole in the vessel

\_\_\_\_\_ Involves formation of blood clot

\_\_\_\_\_ Fibrinogen is converted into fibrin that traps blood cells and forms basis of clot