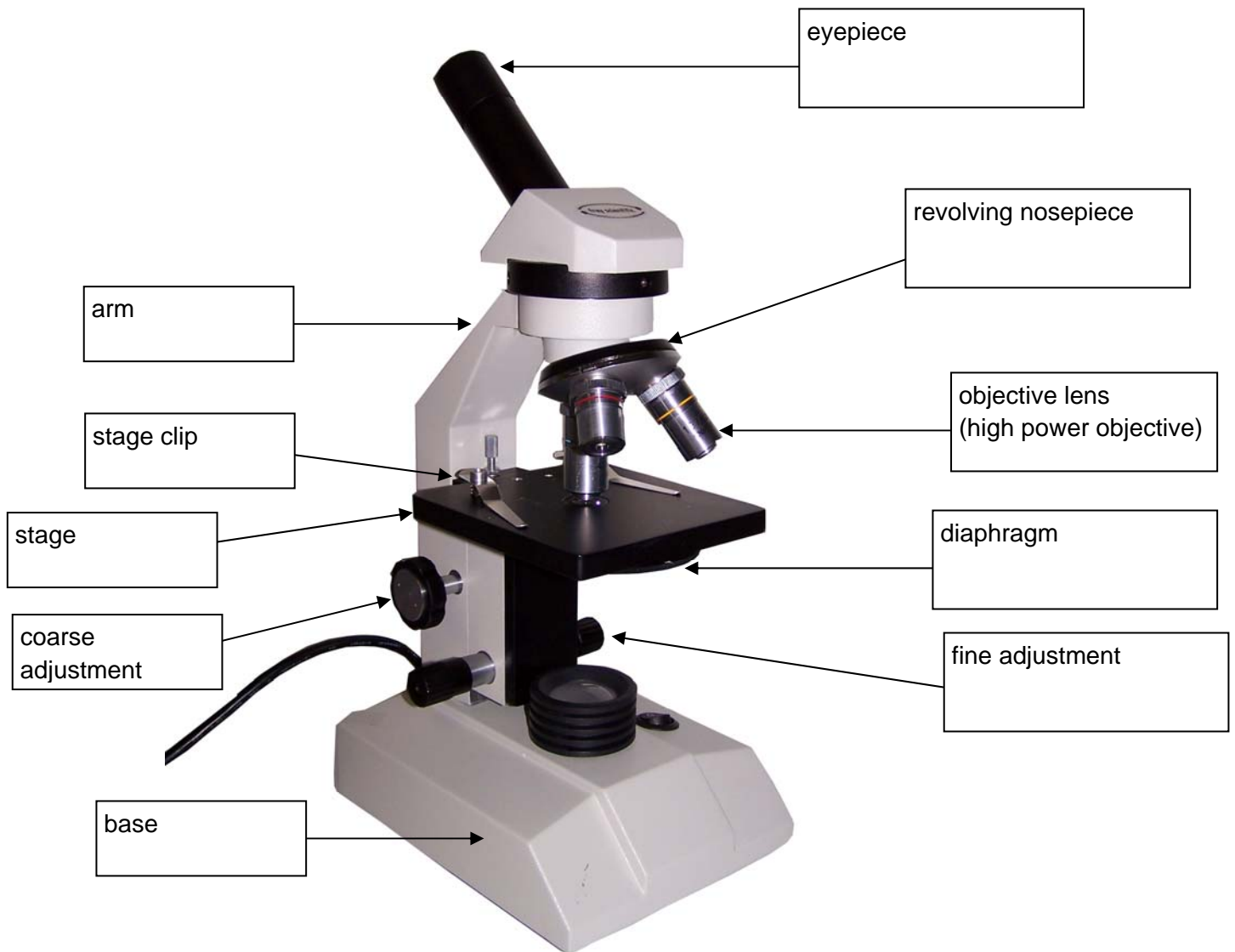


Answer Key for BLM 35



Answer Key for BLM 38

Cyanobacteria have chlorophyll pigment and are able to make their own food. They can exist as a single cell or linked in a colony. *Lactobacilli* are heterotrophs.

Cyanobacteria and *Lactobacilli* are prokaryotic cells.

Cyanobacteria are found in stromatolites, the oldest fossils, which date back to 3.5 million years ago. They provided oxygen to the early atmosphere and continue to do so today.

They create an acidic environment in our mouth, stomach, and digestive tract and protect us from other types of harmful bacteria.

Answer Key for BLM 41

Both are plant cells that contain chloroplasts and are surrounded by a cell wall.

The cell wall maintains the cell shape.

The leaf is considered an organ of the plant because it is made of several tissues, such as epidermal and vascular tissue, which have different functions.

Answer Key for BLM 44

1. Unicellular means to be single celled.
2. *Amoeba* move with pseudopods; *Paramecia* move with cilia. *Paramecia* also have a mouth opening where food enters. *Amoeba* engulf their food and bring it into the cytoplasm, where it is stored in a food vacuole.
3. They are both protozoa, or animallike protists.

Answer Key for BLM 47

1. Multicellular means to have more than one cell.
2. Cheek cells and liver cells are similar in structure in that they have a cell membrane, cytoplasm, and nucleus.
3. The size and shape of the cheek cell differ from the liver cell, which indicates it has a different function.

Answer Key for BLM 48

cell membrane	Protects and supports the contents of the cell. It controls what enters and leaves the cell.	both
nucleus	contains DNA, controls cell activities	both
mitochondrion	provides energy for cell; site for cellular respiration	both
ribosome	site for protein synthesis	both
smooth endoplasmic reticulum	system of highly folded membranes where chemical reactions produce lipids	both
rough endoplasmic reticulum	system of highly folded membranes where chemical reactions produce proteins	both
Golgi apparatus	packages and sorts proteins	both
chloroplast	site for photosynthesis; transforms solar energy into chemical energy	plants
vacuole	storage sac for fluids or food	both, larger in plants
lysosome	contains digestive enzymes to break down proteins, lipids, and carbohydrates	mainly in animals; some plants cells store digestive enzymes in vacuoles
centriole	forms spindle fibers during cell division	animal

Answer Key for BLM 49

Directions Part 1:

1. castle
2. large wall with many gates
3. special furnaces
4. tunnels
5. recycling centers
6. packaging centers
7. corps of knights
8. shops

Directions Part 2:

Answers will vary.

Answer Key for BLM 53

Model A:

4. The beads bounce off each other and move randomly away from the area where they are all grouped together.

Model B:

3. The beads bounce off each other and move randomly away from the area where they are all grouped together. As they approach the barrier, they move through the openings of the barrier. Eventually, the number of beads on both sides of the barrier becomes even.

Model C:

3. The beads bounce off each other and move randomly away from the area where they are all grouped together. As they approach the barrier, only the copper beads are able to move through. The silver beads are too large to pass through the barrier.

Questions:

1. Molecules.
2. The beads bounce off each other and move randomly away from the area where they are all grouped together.
3. The cell membrane.
4. The size of the openings allows materials that are small enough to pass through. Materials that are larger than the openings will not pass through.
5. Active transport requires energy to move molecules against the concentration gradient. These molecules go from a high to low concentration.

Answer Key for BLM 54

Model	Inside Cell			Outside Cell		
	water	solute	%	water	solute	%
A	20	10	67% water	10	20	33% water
B	10	20	33% water	20	10	67% water
C	20	10	67% water	20	10	67% water

Questions:

1. The molecules are represented by copper and silver beads. They all model the osmotic process. The copper beads represent water, and the silver beads represent solute. The small Petri dishes model cells in an external environment. They are different because each model illustrates different concentrations of solute.
2. Model B, Model A.
3. There is 67% water and 33% solute both in and out of the cell; therefore, the cell is in equilibrium.
4. Water molecules continue to pass through the membrane at equal rates, but osmosis would not occur.

Answer Key for BLM 55

Questions:

1. The diffusion rate was fastest in warm water and slowest in ice water.
2. Structure of a cell membrane, density of a molecule, how the molecule is transported, etc.

Answer Key for BLM 56

Questions:

1. The food coloring easily passed through the membrane without destroying it.
2. It is made of lipids and is fluid. There is only one lipid layer, and there are not protein pores or markers.

Answer Key for BLM 57

Questions:

1. The pepper stayed on the surface and moved to the side of the membrane before bursting it. The salt caused the membrane to burst. The bead was able to pass through the membrane.
2. Membranes that allow some substances to pass across it and not others.

Answer Key for BLM 58

Questions:

1. The membrane burst.
2. The soap adhered to the rubber band, which provides support for the pore opening in the membrane.
3. Some molecules are able to pass through the membrane passively through osmosis or diffusion. Molecules that are too big to pass through the lipid bilayer and are necessary for the cell must be transported into it through protein channels.

Answer Key for BLM 62

1. Solution A is salt water; the cell lost water and the membrane shrunk.
2. The *Elodea* and onion cells both responded to their external environment. When both types of cells were placed in salt water, the cells lost water, and their membranes shrunk.
3. The onion bulb grows underground.
4. It shrunk, and the cell membrane pilled away from the cell wall. All the chloroplasts crowded together toward the center of the cell.
5. It swelled; the cell membrane was pushed back to the cell wall. All the chloroplasts spread out again; many are pushed up near the edge of the cell.
6. A semipermeable membrane.
7. 80%
8. The onion cell has 95% water, so when placed in a solution of 80% water, the cell lost water because of osmosis. When the cell was placed in 100% water, water concentration was higher outside the cell than inside; water moved into the cell and it expanded.
9. With 5% dissolved solute, the water concentration is 95%. Water moves from an area of high water concentration to an area of low concentration. When the *Elodea* was placed in salt water, the water concentration was higher inside the cell than outside, and water moved out of the cell.

Answer Key for BLM 63

1. The rounded, concave shape and proteins in the cell membrane provide flexibility to the cell, which keeps the red blood cells from getting stuck in the blood vessels.
2. All the cells in our body require oxygen; therefore, many oxygen-carrying red blood cells are needed.

Answer Key for BLM 64

1. The bone marrow does not produce as many white blood cells. White blood cells can travel from blood vessels to other tissues to attack pathogens.
2. It would indicate some kind of infection or disease.
3. The immune system.

Answer Key for BLM 65

1. They help with clotting when an injury takes place.
2. It is positive in the healing of the blood vessel but negative if the clot loosens and blocks blood flow in another area of the body.
3. No, because they are only a fragment of a larger cell.

Answer Key for BLM 66

Model Piece	Blood Components	# of Cells	% Composition
Red Beads	RBCs	1,000	45%
Large Beads	WBCs	2	
Small Beads	Platelets	100	
Fluid	Plasma	no cells	55%

Questions:

1. Plasma.
2. The blood transports several kinds of cells and dissolved substances. Its fluid nature makes transport of materials easier. Dissolved substances can cross cell membranes better in a fluid environment.

Answer Key for BLM 67

1. Patient 1 is healthy.

Patient 3 is anemic.

Patient 2 has erythrocythemia.

2. The number of red blood cells is directly related to how well the cells of the body are supplied with oxygen. However, if there are too many red blood cells, the blood can become too thick to flow well and cells will not receive the required oxygen.

Answer Key for BLM 68

1. Patient 1 is type B and Patient 2 is type A.
2. Type A and type AB people can receive type A blood. Type B and type AB people can receive type B blood.

Answer Key for BLM 69

Answers are found on Trans 17.

Answer Key for BLM 72

Glucose Test

Chemical Properties of Urine Analysis: Glucose		
Urine Sample	Color Before Heating	Color After Heating
Control		
Patient A		orange
Patient B		
Patient C		

Protein Test

Chemical Properties of Urine Analysis: Protein		
Urine Sample	Color Before Heating	Color After Heating
Control		
Patient A		
Patient B		purple
Patient C		

Answer Key for BLM 73

Physical Properties Analysis

Physical Properties of Urine Analysis			
Urine Sample	Color	Clarity	Specific Gravity
Control	yellow	clear	~1.000
Patient A	yellow	clear	~1.014
Patient B	pale yellow	cloudy	~1.019
Patient C	yellow	clear	~1.030

Analysis:

1. a. clarity
b. glucose—Benedict's
c. protein—biuret
2. diabetes mellitus
3. kidney disease
4. normal
5. Patient C
6. comparison

Answer Key for BLM 74

1. We use the outside of our arms for protection when attacked or when moving through crowded places.
2. Fewer receptors mean fewer stimuli and possibly less pain.
4. We use our hands to explore and manipulate objects in our environment. More receptors give us better information and protect us from injury.
5. This allows us to sense and respond to changes in our environment so that our body can maintain stability.

Answer Key for BLM 75

1. Answers may vary.
2. Cellular activity, lung capacity, fitness, faster blowing, etc.
3. Answers may vary.
4. Increase breathing rate.
5. Since CO₂ is a waste product, it is important to get rid of it so that toxic levels do not build up in the body.

Answer Key for BLM 76

1. The pupil gets smaller in the presence of light and larger when the amount of light decreases.
2. They both responded by getting smaller, but the response was much quicker to the bright light.
3. The pupil's response is automatic. When there is too much light and the pupil shrinks, the inside of the eye is protected from damage. When it is darker and the pupil responds, we can see to move around safely.

Answer Key for BLM 77

1. Answers will vary.
2. At the beginning, the system was out of balance. By adding water to the cup, the lever eventually balanced, reaching homeostasis. When too much water was added, the system became unbalanced, releasing the ball into the cup. The ball symbolizes a monitoring system that turns off the production of a hormone in a negative feedback loop.
3. If there is too little, then growth will be stunted. If there is too much, then growth may be increased beyond average.

Answer Key for BLM 78

Before Reading

After Reading

1. A

2. D

3. D

4. A

5. A

6. A

7. A

Answer Key for BLM 79

Answers are found on Trans 20.

Answer Key for BLM 81

Model A: *diplococcus*

Model B: *staphylococcus*

Model C: *diplobacillus*

Model D: *streptobacillus*

Model E: *spirillum*

Model F: *streptospirillum*

Answer Key for BLM 84

2. Bacteria were grown in a Petri dish. The dish was sectioned off into four quadrants. Three paper disks treated with different antibiotics and labeled A, B, and C were placed into a quadrant. A fourth disk labeled D had no antibiotic and served as the control in the fourth quadrant. After a period of time, the Petri dish was examined for the effect of antibiotics on the growth of bacteria.