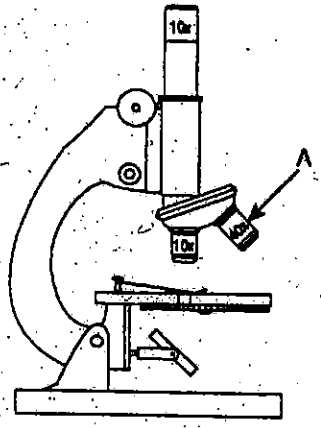
Microscope Post-Lab Questions

1. Base your answer on the diagram below of a compound light microscope on your knowledge of biology.



To locate and observe a specimen on a slide with this microscope, a student should begin by using

(1) the coarse adjustment and the low-power objective

(2) the fine adjustment and the high-power objective

(3) a closed diaphragm and the low-power objective

(4) high light intensity and the high-power objective

2. A student views a wet mount of a specimen with the low-power objective of a compound light microscope. After the student switches to hi power, which procedure would most likely produce a better view of the specimen?

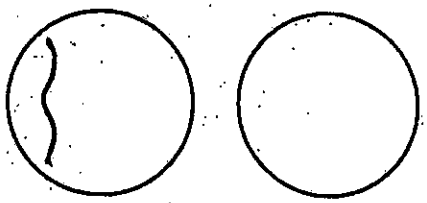
(1) increasing the amount of light by adjusting the diaphragm

(2) increasing the distance between the slide and the low-power objective, using the coarse adjustment

(3) removing the water from the slide

(4) removing the coverslip from the slide

3. A wet-mount slide preparation of a thread viewed in the low-power field (100×) of a compound light microscope is shown in diagram *A* below. Diagram *B* shows the field of view as it appeared when the objective was switched to high power.



Which statement best explains why the thread is not visible in diagram *B*?

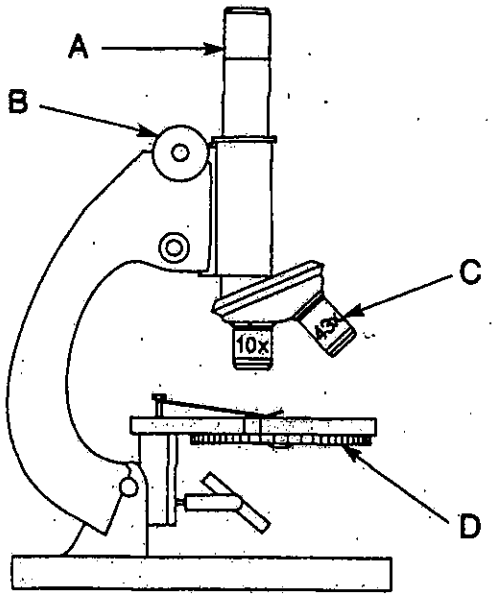
(1) No stain was added to the slide preparation.

(2) The specimen was not centered in the low-power field.

(3) The diaphragm was not adjusted for more light.

(4) The thread is too large to be viewed with high power.

4. A compound light microscope is represented in the diagram below.



Which microscope part is correctly paired with its function?

(1) *A* – magnifies the image of the specimen
(2) *B* – used for focusing only when the high-power objective is used
(3) *C* – provides the field of view with the largest diameter
(4) *D* – holds the specimen on the stage

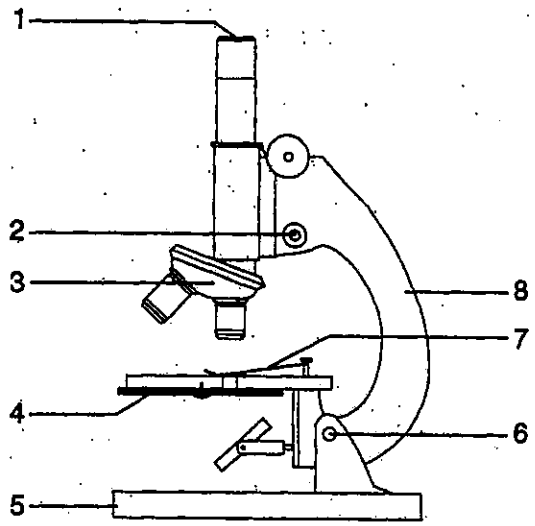
5. Which statement best describes the procedure for removing excess water from a wet mount slide preparation?

(1) Remove the coverslip and drop water onto the specimen.
(2) Place a piece of paper towel at one edge of the coverslip to absorb the excess water.
(3) Insert a pipette under the coverslip and with draw some water.
(4) Remove the coverslip, allow the water to dry, and then replace the coverslip.

6. A student used a light microscope to observe a cell under low power. After the student switched to high power and attempted to focus, the cell was no longer visible. What was most likely the cause of the disappearance of the cell?

(1) The diaphragm was open while the student observed the cell under low power.
(2) The distance between the specimen and the objective lens decreased after the student switched to high power.
(3) The student focused the eyepiece before observing the cell under high power.
(4) The cell was not in the center of the field of view when the student observed it under low power.

7. Base your answer on the diagram below and on your knowledge of biology.

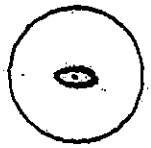


After part 3 is turned, which part must often be adjusted?

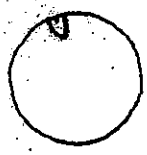
(1) 1
(2) 5
(3) 6
(4) 4

8. Which statement best explains why a living organism in a wet mount moves into and out of focus within the field of view of a microscope?
   (1) The stage clips are too tight.
   (2) The organism moves to different levels in the wet mount.
   (3) The eyepiece is too far from the wet mount.
   (4) The opening in the diaphragm is too large.

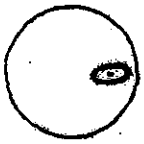
9. The diagram below represents a wet mount of a protist as seen under a compound microscope.



If the protist swims toward the left side of the slide, which diagram represents the image that will be observed through the microscope?

(1)


(3)

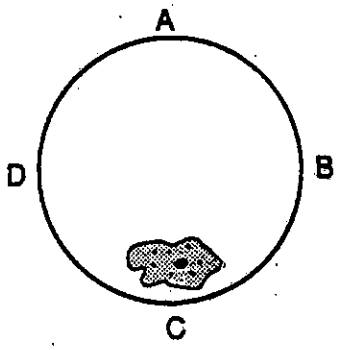

(2)


(4)


10. The field of view becomes darker when a compound microscope is switched from low to high power. The field of view can then be made brighter by
   (1) decreasing the size of the diaphragm opening
   (2) increasing the size of the diaphragm opening
   (3) refocusing with the fine adjustment
   (4) refocusing with the coarse adjustment

11. Which part of a light microscope would most likely be damaged if the coarse adjustment is improperly used while a specimen is being observed under high power?
   (1) objective lens
   (2) light source
   (3) iris diaphragm
   (4) eyepiece lens

12. The diagram below represents a cell in the field of view of a compound light microscope.



In which direction should the slide be moved on the microscope stage to center the cell in the field of view?
   (1) toward *A*
   (2) toward *B*
   (3) toward *C*
   (4) toward *D*

13. A student is examining stages of mitotic cell division with a compound microscope. Some of the steps she takes are listed below.

A Focus under high power using the fine adjustment.
B Position the specimen under low power.
C Scan the field of view under low power.
D Focus under low power using the coarse adjustment.
E Adjust the diaphragm opening.

What sequence of steps should the student follow?

(1) *A-C-B-E-D*
(2) *D-A-B-C-E*
(3) *B-E-D-C-A*
(4) *C-E-B-A-D*

14. Onion epidermis is a suitable tissue to use for observing cellular structures with a compound light microscope because this tissue is thin enough to

(1) fit on top of a coverslip
(2) be placed very close to the ocular
(3) allow water to diffuse through the cell membrane
(4) allow light to pass through it

15. A student views some cheek cells under low power. Before switching to high power, the student should

(1) adjust the eyepiece
(2) center the image being viewed
(3) remove the slide from the stage
(4) remove the coverslip

16. Which part of a microscope should be used with the low-power objective, but *not* with the high-power objective?

(1) coarse adjustment
(2) fine adjustment
(3) diaphragm
(4) ocular

17. Which part of a compound light microscope should a student adjust to allow more light to pass through a specimen?

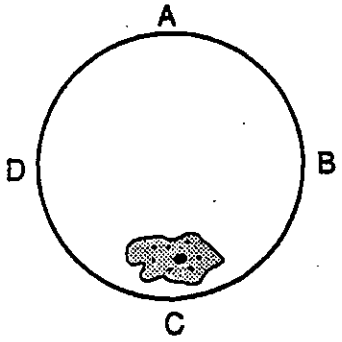
(1) fine adjustment
(2) ocular
(3) diaphragm
(4) stage

18. The diameter of the field of a microscope under low power magnification is 1.2 millimeters. What is the diameter in microns?

(1) 12 microns
(2) 120 microns
(3) 1,200 microns
(4) 12,000 microns

Animal Cell vs. Plant Cell Post-Lab Questions

1. The diagram below represents a cell in the field of view of a compound light microscope.



In which direction should the slide be moved on the microscope stage to center the cell in the field of view?

(1) toward *A*
(2) toward *B*
(3) toward *C*
(4) toward *D*

2. Which part of a compound light microscope should a student adjust to allow more light to pass through a specimen?

(1) fine adjustment
(2) ocular
(3) diaphragm
(4) stage

3. A paramecium on a slide can usually be found more easily by using the low-power objective rather than the high-power objective, because with low power

(1) the field is not as bright
(2) the organism can be seen in greater detail
(3) smaller organisms can be seen
(4) a larger part of the slide can be seen

4. A student views some cheek cells under low power. Before switching to high power, the student should

(1) adjust the eyepiece
(2) center the image being viewed
(3) remove the slide from the stage
(4) remove the coverslip

5. Onion epidermis is a suitable tissue to use for observing cellular structures with a compound light microscope because this tissue is thin enough to

(1) fit on top of a coverslip
(2) be placed very close to the ocular
(3) allow water to diffuse through the cell membrane
(4) allow light to pass through it

6. A student lightly scraped the inside of his mouth with the blunt end of a toothpick. He placed a small sample of cheek cells in a drop of water on a microscope slide. Which substance could the student add to the cells so that the nuclei would be more visible under the light microscope?

(1) methylene blue
(2) salt water
(3) white vinegar
(4) Benedict's solution

7. Iodine was added to a wet mount of onion cells that was being observed with the compound light microscope. The iodine was probably used to aid in the observation of

(1) chloroplasts
(2) ribosomes
(3) nuclei
(4) contractile vacuoles

8. A student adds several drops of iodine solution to a sample of onion tissue. Which cell component would become more visible under low power of a compound light microscope as a result of this procedure?
   (1) centriole
   (2) Golgi complex
   (3) deoxyribonucleic acid
   (4) nucleus

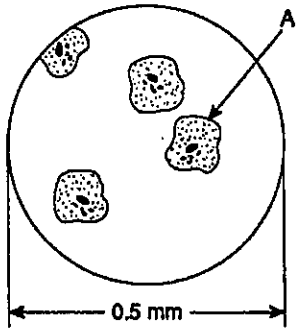
9. During the preparation of a wet mount of an elodea leaf, a student dropped a plastic cover slip directly on top of the drop of water containing the specimen on the slide. This slide preparation technique most probably
   (1) caused the cover slip to shatter
   (2) crushed the specimen
   (3) trapped air bubbles under the cover slip
   (4) scratched the surface of the slide

10. Which organelles would be most visible in a stained elodea leaf when viewed with the low-power objective of a compound light microscope?
   (1) endoplasmic reticula, chloroplasts, and nuclei
   (2) cell walls, nuclei, and ribosomes
   (3) chloroplasts, nuclei, and mitochondria
   (4) cell walls, chloroplasts, and nuclei

11. When preparing a wet mount of onion cells, a student put a drop of Lugol's iodine solution on the slide. Lugol's iodine solution was applied in order to
   (1) prevent air bubbles
   (2) make cell structures more visible
   (3) increase the magnification
   (4) increase respiration in the cells

12. Which statement best describes the procedure for removing excess methylene blue from a wet mount slide preparation?
   (1) Remove the coverslip and drop water onto the specimen.
   (2) Place a piece of paper towel at one edge of the coverslip to absorb the methylene blue, and then add water at the opposite edge of the coverslip.
   (3) Insert a pipette under the coverslip and with draw some methylene blue.
   (4) Remove the coverslip, allow the methylene blue to dry, and then replace the coverslip.

Base your answers for questions **13** and **14** on the diagram below and on your knowledge of biology. The diagram shows cells as seen in the high-power (400×) field of view of a compound light microscope.



13. What is the approximate diameter of cell *A* in micrometers?
   (1) 1
   (2) 100
   (3) 150
   (4) 250

14. If the microscope is switched to low power (100×), approximately how many complete cells the size of cell *A* could be viewed side by side across the diameter of the low-power field of view?

(1) 5
(2) 10
(3) 20
(4) 80

15. Which paragraph describes the correct procedure for preparing a stained wet mount of onion epidermis?

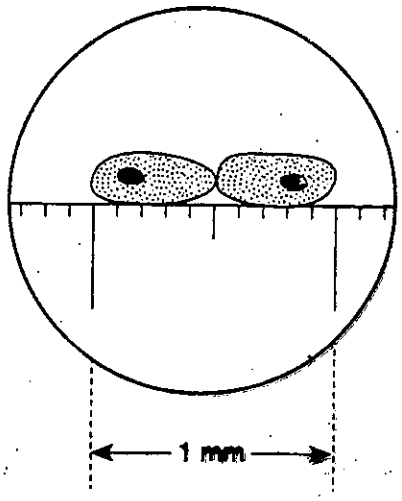
(1) Place a piece of onion epidermis on a slide. Add two drops of water and one drop of stain. Cover the slice by dropping a cover slip directly on top of it. Press the coverslip to force air bubbles out. Add one drop of water to one edge of the coverslip, and add one drop of stain to the opposite edge.

(2) Add one drop of stain to a piece of onion epidermis. Using forceps, place the epidermis on a slide. Blot the epidermis with a piece of paper towel to remove the excess stain. Drop a coverslip onto the specimen.

(3) Place a piece of onion epidermis on a slide. Add one drop of water. Put one edge of a coverslip in the water drop, then slowly lower the opposite edge to the water. Put one drop of stain at one edge of the coverslip. Put a piece of paper towel at the opposite side of the coverslip. Allow the towel to absorb some water so that the stain will move under the coverslip.

(4) Add one drop of stain to a slide. Place a piece of onion epidermis on top of the stain. Use a piece of paper towel to absorb the stain. Drop a coverslip on the epidermis to flatten it out. Lift the coverslip and add a drop of water to the epidermis. Replace the coverslip.

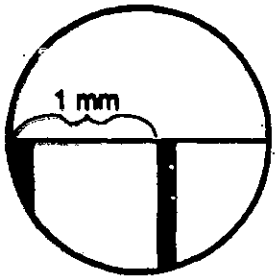
1. The diagram below represents two cells next to a metric measuring device under the low-power objective of a compound light microscope.



What is the approximate length of a nucleus of one of these cells?

(1) 100 µm
(2) 500 µm
(3) 1000 µm
(4) 1500 µm

2. The diagram below represents a portion of a metric ruler as seen with a compound microscope.

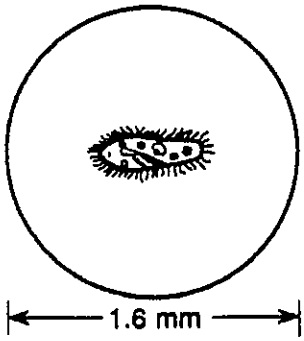


The diameter of the field of view illustrated is approximately

(1) 1,600 mm
(2) 0.0016 mm
(3) 1,600 µm
(4) 2,000 µm

3. Base your answer on the information and diagram below and on your knowledge of biology.

The diagram below represents a paramecium observed by a student using the low power objective (100×) of a compound light microscope.

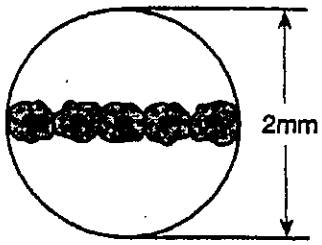


Microscope Field of View

The approximate length of the paramecium is

(1) 40 µm
(2) 160 µm
(3) 300 µm
(4) 700 µm

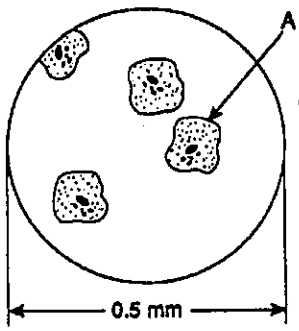
4. The diagram below represents cells seen in the low-power field of view of a compound light microscope.



The length of one of these cells is approximately

(1) 200 µm
(2) 400 µm
(3) 500 µm
(4) 2,000 µm

Base your answers for questions **5** and **6** on the diagram below and on your knowledge of biology. The diagram shows cells as seen in the high-power (400×) field of view of a compound light microscope.



5. What is the approximate diameter of cell *A* in micrometers?

(1) 1
(2) 100
(3) 150
(4) 250

6. If the microscope is switched to low power (100×), approximately how many complete cells the size of cell *A* could be viewed side by side across the diameter of the low-power field of view?

(1) 5
(2) 10
(3) 20
(4) 80

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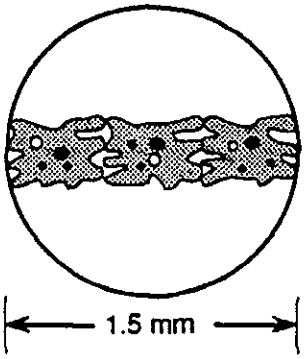
7. The diagram below represents the field of view of a compound light microscope. Three unicellular organisms are located across the diameter of the field.



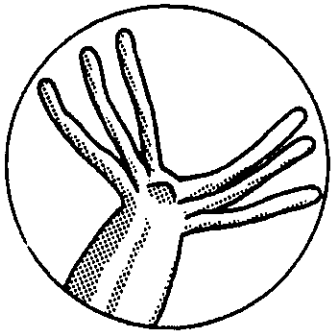
What is the approximate length of each unicellular organism?

(1) 250 µm
(2) 500 µm
(3) 1,000 µm
(4) 1,500 µm

8. A student using a compound microscope measured the diameter of several red blood cells and found that the average cell length was 0.008 millimeter. What is the average length of a single red blood cell in micrometers?

(1) 0.8
(2) 8
(3) 80
(4) 800

9. The diagram below illustrates a part of a hydra as seen with the low-power objective of a compound microscope. The diameter of the low-power field of view is 1.4 millimeters.



The length of one of the tentacles is closest to

(1) 300 μm
(2) 700 μm
(3) 1,100 μm
(4) 1,400 μm

10. A student was observing cells with the microscope and noted that one cell occupied one-fourth of the diameter of the field of view. If the diameter of the field was 1.5 millimeters, what was the approximate length of the cell?

(1) 1.5 µm
(2) 38 µm
(3) 375 µm
(4) 1,500 µm