

## Making Observations with a Microscope

### Focus Question

How does the microscope extend our ability to make observations?

### Materials

Slides of “e”, clear plastic ruler, sugar, salt, wool and cotton, colored comics, mystery slide, colored pencils, microscope

### Turn/Talk/Record

1. Magnification happens when things appear larger than they are. We will be using a compound microscope to examine small objects. One lens is found on the eye piece. This lens magnifies 10 times – written as 10x. We have three lenses on the revolving nose piece of our microscope. When you turn the nose piece we can increase or decrease the magnification of an object. The eye piece lens is always present and magnifies an object 10x. If we turn the revolving nose piece to magnify the object 10x, the total magnification of an object would be 10x greater than the eyepiece alone. The total magnification of the microscope would be  $10 \times 10$  or 100 times – written as 100x.

Calculate the total magnification for a microscope that has an eyepiece magnification of 10x, and three different nosepiece magnifications of 4x, 10x, or 40x.

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2. There is a lamp at the bottom of the microscope passing light through the slide, nose piece lens and eyepiece lens. What do you think would happen if the object on the slide was too thick for light to pass through?

3. How is using a microscope different than using a magnifying glass?

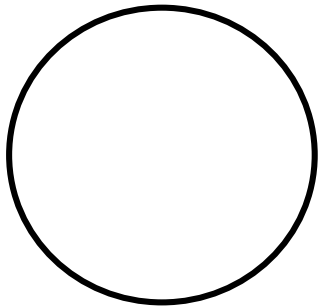


Image credit: Microsoft Clipart – Creative Commons

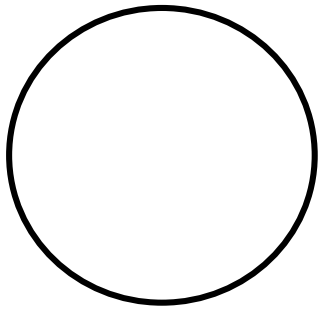
4. Label the parts of the microscope: eyepiece, arm, revolving nose piece, stage, stage clip, coarse focus, fine focus, light source.

## Procedure

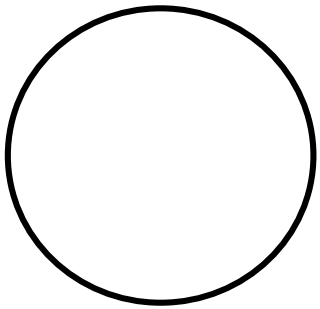
1. Place the ruler on the stage of the microscope, millimeter marks should be over the path of the light from the lamp. Secure the ruler with the stage clips.



Draw what you see on low power



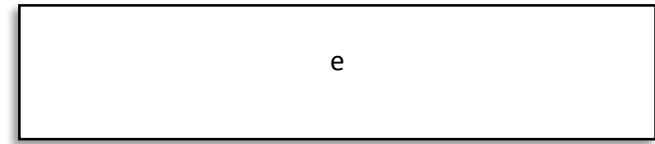
Draw what you see on medium power



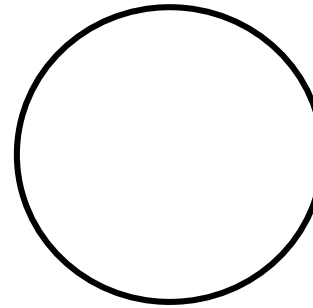
Draw what you see on high power

2. What happened to the millimeter marks as you increased the power?

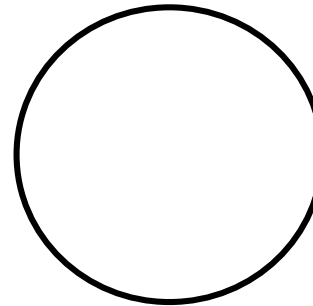
3. Find the slide with the letter “e” and place it on the stage of the microscope, the eye should be over the path of the light from the lamp and the slide secured with the stage clips.



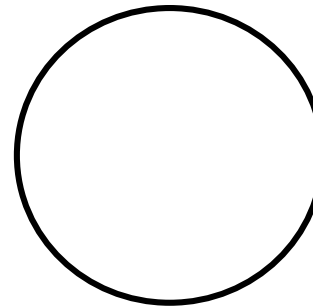
Be sure to place the slide on the stage as shown above.



Draw what you see on low power



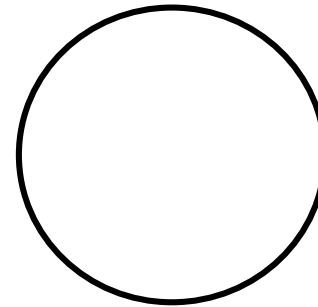
Draw what you see on medium power



Draw what you see on high power

4. How does the letter “e” change when you look at it under the microscope?
5. Move the letter “e” slide to the left. In which direction does the letter “e” seem to move?
6. How does the ink of the letter “e” appear under the microscope?  
How is this different than what you see with you eye alone?
7. Why is it important that an object is thin when viewing it under the microscope?

8. Observing Salt
  - a. Describe the salt before placing the slide on the microscope stage.
  - b. Draw the salt.
  - c. Place the salt slide on the microscope stage. Be sure the salt is in the path of the light. Secure the slide with the stage clips. Draw what you see.



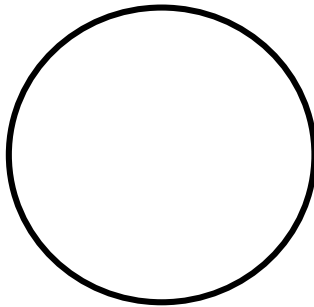
What magnification did you use?

9. Observing Sugar

- a. Describe the sugar before placing the slide on the microscope stage.

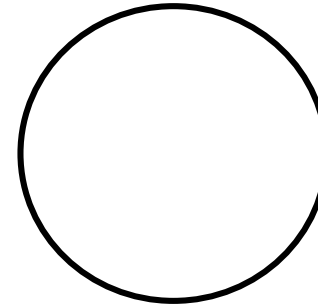
- b. Draw the sugar.

- c. Place the sugar slide on the microscope stage. Be sure the salt is in the path of the light. Secure the slide with the stage clips. Draw what you see.



What magnification did you use?

10. Place the mystery slide on the microscope stage. Be sure the object is in the path of the light. Secure the slide with the stage clips. Draw what you see.

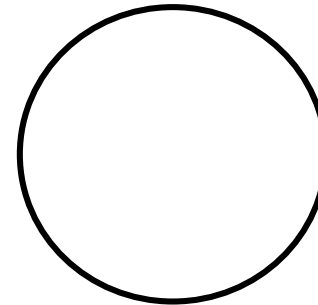


11. What is the letter of the mystery slide? \_\_\_\_\_

12. Is the object on the mystery slide salt or sugar?

13. Observing Cotton

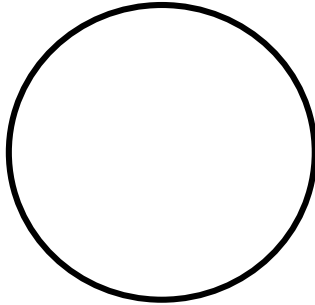
- a. Place the cotton slide on the microscope stage. Be sure the cotton is in the path of the light. Secure the slide with the stage clips. Draw what you see.



What magnification did you use?

#### 14. Observing Wool

- a. Place the wool slide on the microscope stage. Be sure the wool is in the path of the light. Secure the slide with the stage clips. Draw what you see.

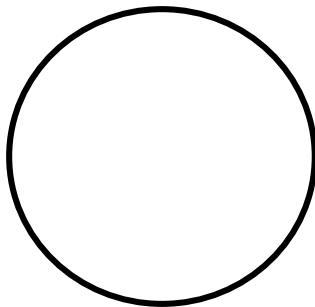


What magnification did you use?

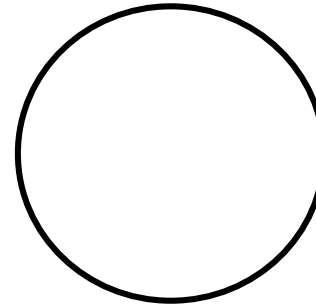
#### 15. Observing Comics

- a. There are only four colors used by the printer that created this comic; black, cyan, magenta and yellow. Yet when I look at the comic, I can clearly see other colors.

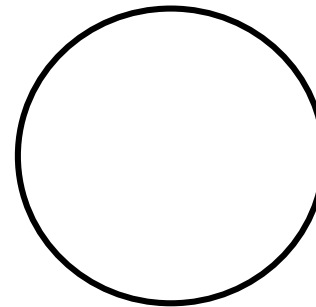
Examine several different colored sections of the comics and record what you see using colored pencils to accurately represent your observations.



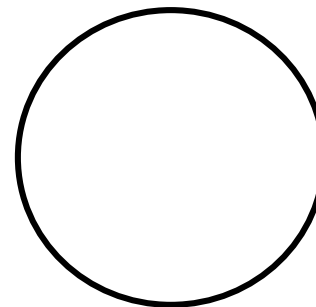
Color I saw before viewing under the microscope \_\_\_\_\_



Color I saw before viewing under the microscope \_\_\_\_\_



Color I saw before viewing under the microscope \_\_\_\_\_



Color I saw before viewing under the microscope \_\_\_\_\_

- b. How are so many different colors created when only four ink colors are used by the printer?