

SNC2D BIOLOGY

TISSUES, ORGANS & SYSTEMS OF ...

🔍 The Microscope
(P.16-20 & 542)

The Microscope

*Most cells are too small to be seen by the unaided eye. The invention of the **microscope** in the mid-1600s allowed scientists to peer into the hidden world beyond the range of human vision – it made it possible for scientists to observe cells. Robert Hooke was the first to describe cells in 1663. He thought that the cells were the passages for fluids in a plant. We now understand that a cell is the basic building block of life.*

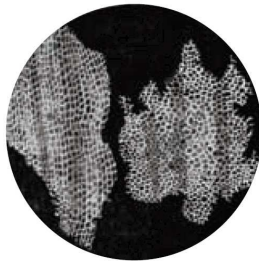


Figure 1.2 Robert Hooke's drawing of cork cells, as seen under a microscope. He used the term "cells" based on what he saw.

March 15, 2013

2DBIOL - The Microscope

1

The Microscope

Today, biologists use different types of microscopes such as the powerful electron microscope to explore cell structure and function. This knowledge is useful in assessing our health because cells can be viewed under a microscope to look for abnormalities.

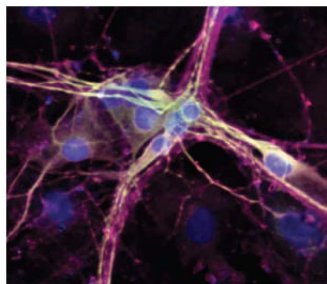



Figure 1.20 A micrograph showing nerve cells that have been stained with a fluorescent stain.

March 15, 2013

2DBIOL - The Microscope


2

 **The Microscope**

MICROSCOPE

- ❖ invented in the mid-1600s
- ❖ allows scientists to observe and study cells since they are too small to be seen by the unaided eye
- ❖ Robert Hooke was the first to describe cells in 1663
- ❖ made cell theory possible


March 15, 2013 2DBIOL - The Microscope 3

 **Activity: Parts of a Microscope (WS2/P.17)**

INSTRUCTIONS

1. Use the information on P.17 of your text to complete 2DBIOL - WS2 (Parts of a Microscope).
2. When you are finished read "Using a Microscope" / P.542-545

March 15, 2013 2DBIOL - The Microscope 4

 **Using The Microscope**

REMEMBER!

- ① Carry the microscope with two hands – one on the arm, and the other on the base.
- ② Place the microscope gently on the table. Plug the microscope in, and turn on the power.
- ③ Rotate the nosepiece to the lowest power. Lower the stage.
- ④ Place the prepared slide on the stage, under the stage clips.
- ⑤ While looking from the side, raise the stage as close as possible to the objective lens, without touching it.
- ⑥ While looking through the eyepiece, lower the stage using the coarse adjustment knob until the image comes into view.
- ⑦ Use the fine focus knob to obtain the best image.
- ⑧ If you need to use a higher objective lens, watch from the side as you rotate the nosepiece to ensure the lens does not touch the slide.

March 15, 2013 2DBIOL - The Microscope 5

Activity: Using the Microscope (P.542-545)

INSTRUCTIONS

- A. Working in pairs, obtain a prepared slide(s) from the teacher.
- B. Place the prepared slide on the microscope and, using proper microscope skills, obtain an image.
- C. Move the slide up/down. Which direction does the image move?
- D. Move the slide left/right. Which direction does the image move?
- E. Return the slide.

March 15, 2013 2DBIOL - The Microscope 6

Activity: Using the Microscope (P.542-545)

QUESTIONS

- 1. What did you notice when you moved the slide:
 - (a) up/down?
 - (b) left/right?

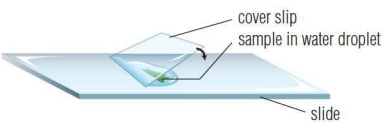
(a) the image moved down/up
(b) the image moved right/left

March 15, 2013 2DBIOL - The Microscope 7


Activity: Using the Microscope (P.542-545)

INSTRUCTIONS

- F. Obtain a sample of pond water and place it on a clean microscope slide. Cover the pond sample with a cover slip, being careful not to trap any air (i.e. lower the cover slip at an angle).
- G. Observe your pond sample using the microscope. You may have to move the slide around until you locate something interesting.
- H. Rinse the microscope slide and cover slip with water and then dry and return them.




March 15, 2013 2DBIOL - The Microscope 8

 **Using The Microscope**

REMEMBER!

- ① Rotate the nosepiece to the lowest objective power, lower the stage, and remove the slide.
- ② Turn off the light, unplug the cord, and wrap the cord neatly around the microscope.
- ③ Use two hands to carry the microscope back to the storage area. Place the protective bag over the microscope before you store it away.


March 15, 2013 2DBIOL - The Microscope 9

 **✓ Check Your Learning**

1. Why do you watch from the side as the stage is raised up towards the objective lens?

to ensure the lens does not touch the slide and possibly damage the lens/slide

March 15, 2013 2DBIOL - The Microscope 10

 **✓ Check Your Learning**

2. When you prepare a wet mount, why is it important to lower the cover slip on an angle?

to ensure that no air becomes trapped under the cover slip – an air bubble looks like a cell with a thick membrane

March 15, 2013 2DBIOL - The Microscope 11



✓ Check Your Learning

3. How do you determine the total magnification of the system?

$$M_{\text{total}} = M_{\text{eye}} \times M_{\text{objective}}$$

March 15, 2013

ZDBIOL - The Microscope

12
