

MICROSCOPE

at pppst.com





Objectives

- Make observations using a microscope
- Learn that cells are the basic units of life and are organized into tissues from which organs are made
- Explore cell structure and differences between plant and animal cells
- Learn about some functions of cells

Objectives

- Describe different levels of organisation of cells in an organism
- Explain the importance of the different tissues in an organ
- Explain how artificial organs are used to replace damaged organs

Key Terms

- Magnification
- Objective
- Aperture
- Diaphragm
- Tissue
- Organism
- Organ
- Cell
- Artificial organ
- Dialysis

Key Terms

- Membrane
- Cytoplasm
- Nucleus,
- Chloroplast
- Vacuole

The Microscope

A 3D rendered microscope is the central focus of the image. It is positioned on a blue, draped surface. The background is a vibrant sunset or sunrise over a body of water, with a gradient from orange at the top to yellow and then blue at the bottom. The microscope is rendered in a dark, metallic color with some highlights. The text 'The Microscope' is written in a large, white, sans-serif font at the top of the image. Below the title, there are two bullet points in white text, also in a sans-serif font. The overall composition is clean and professional, with a clear focus on the microscope and its applications in science.

- Microscopes have opened the unseen world to scientists
- Scientists can use microscopes to trace very tiny particles entering the body

The History

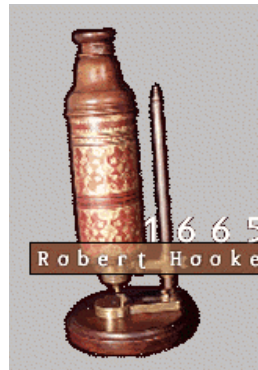
- Many people experimented with making microscopes
- The first microscope was 2 metres long!!!
- The Greeks & Romans used “lenses” to magnify objects over 1000 years ago.

The History

- Hans and Zacharias Janssen of Holland in the 1590's created the "first" compound microscope
- Anthony van Leeuwenhoek and Robert Hooke made improvements by working on the lenses



Anthony van Leeuwenhoek
1632-1723



Hooke Microscope



Robert Hooke
1635-1703

The History



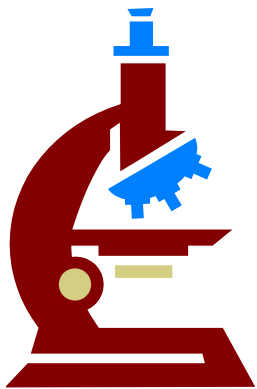
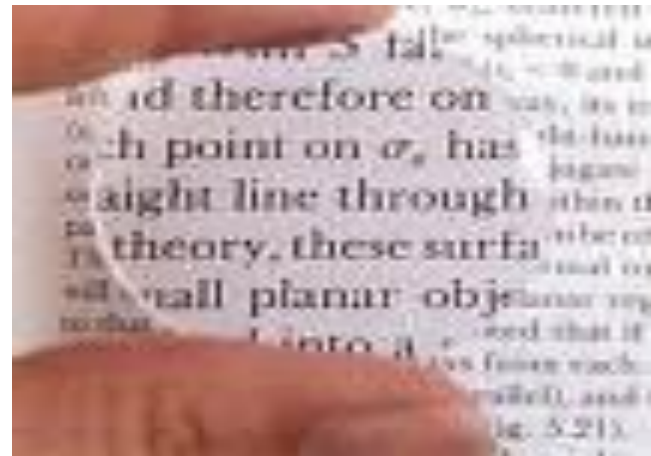
Zacharias Jansen
1588-1631



The "First" Microscope

How a Microscope Works

Convex Lenses are curved glass used to make microscopes



Convex Lenses bend light and focus it in one spot.

How a Microscope Works

Ocular Lens
(Magnifies Image)

Body Tube
(Image Focuses)



Objective Lens
(Gathers Light,
Magnifies
And Focuses Image
Inside Body Tube)

•**Bending Light:** The objective (bottom) convex lens magnifies and focuses (bends) the image inside the body tube and the ocular convex (top) lens of a microscope magnifies it (again).

Types of Microscopes



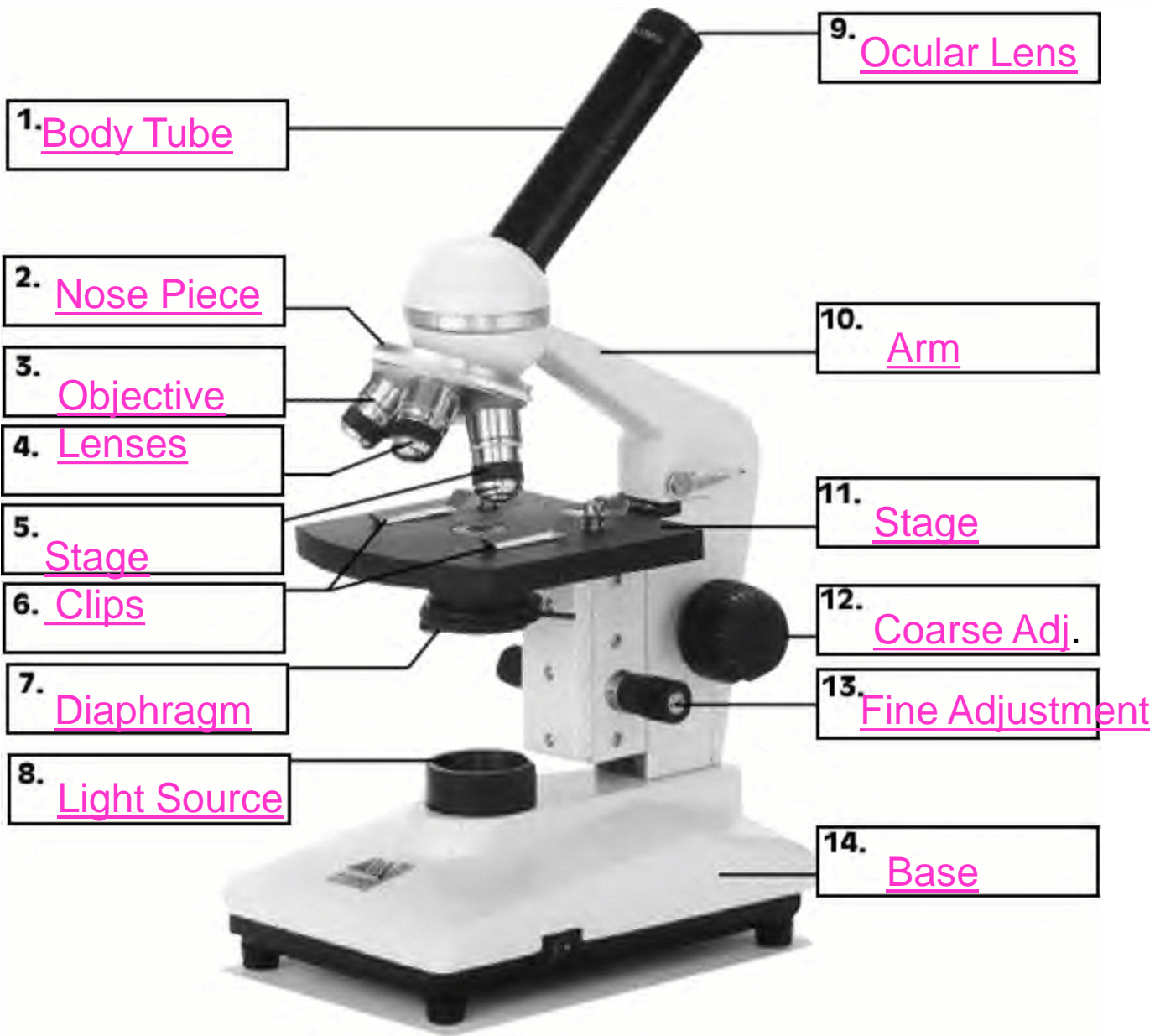
Stereomicroscope



electron microscope

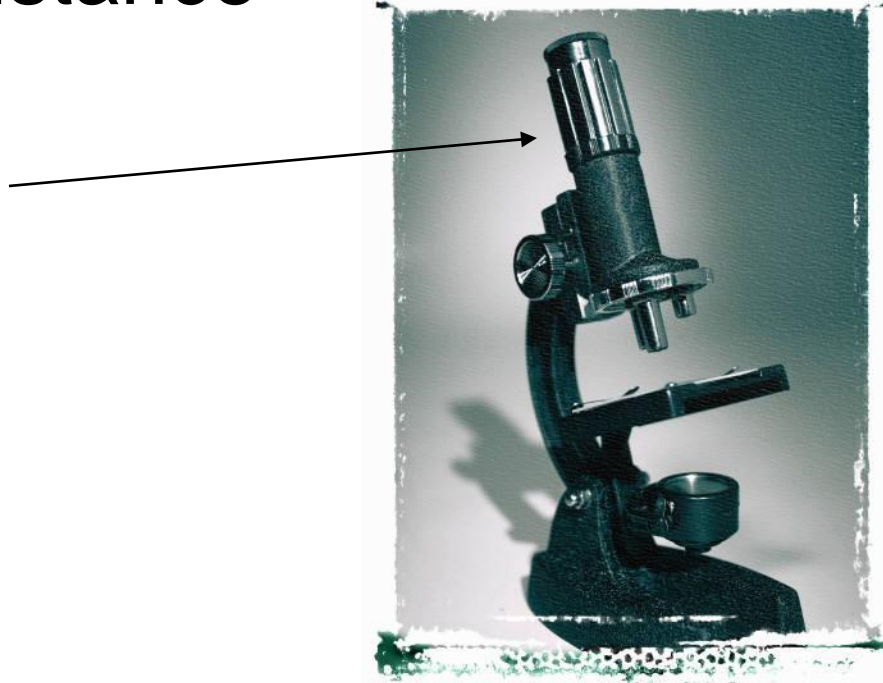
The Parts of a Microscope





Body Tube

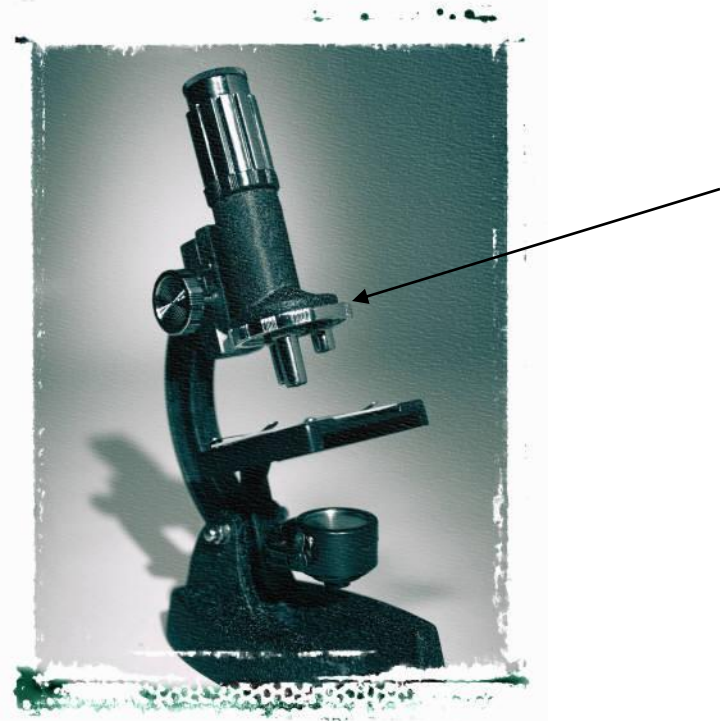
- The body tube holds the objective lenses and the ocular lens at the proper distance



Diagram

Nose Piece

- The Nose Piece holds the objective lenses and can be turned to increase the magnification



Objective Lenses

- The Objective Lenses increase magnification (usually from 10x to 40x)



Diagram

Stage Clips

- These 2 clips hold the slide/specimen in place on the stage.



Diagram

Diaphragm

- The Diaphragm controls the amount of light on the slide/specimen



Turn to let more light in or to make dimmer.

Light Source

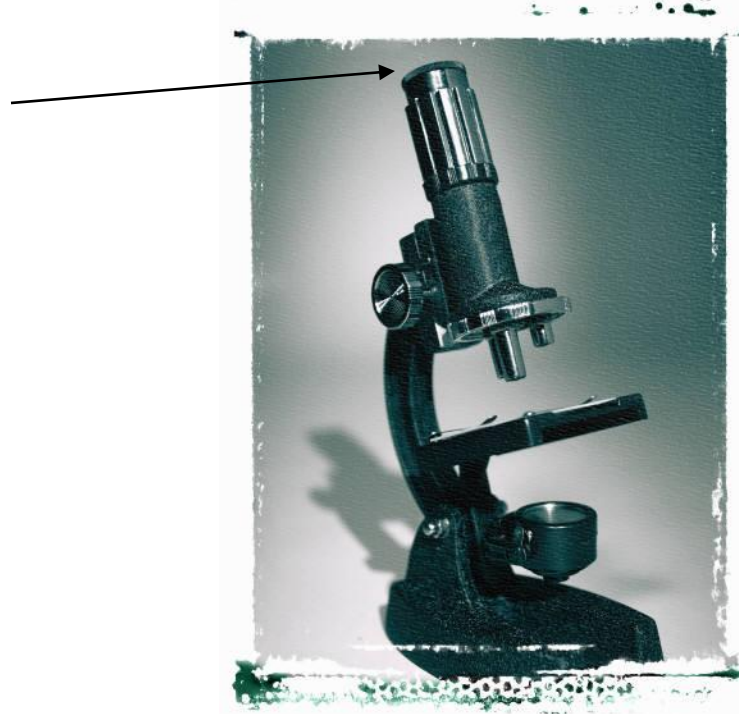
- Projects light upwards through the diaphragm, the specimen and the lenses
- Some have lights, others have mirrors where you must move the mirror to reflect light



Diagram

Ocular Lens/Eyepiece

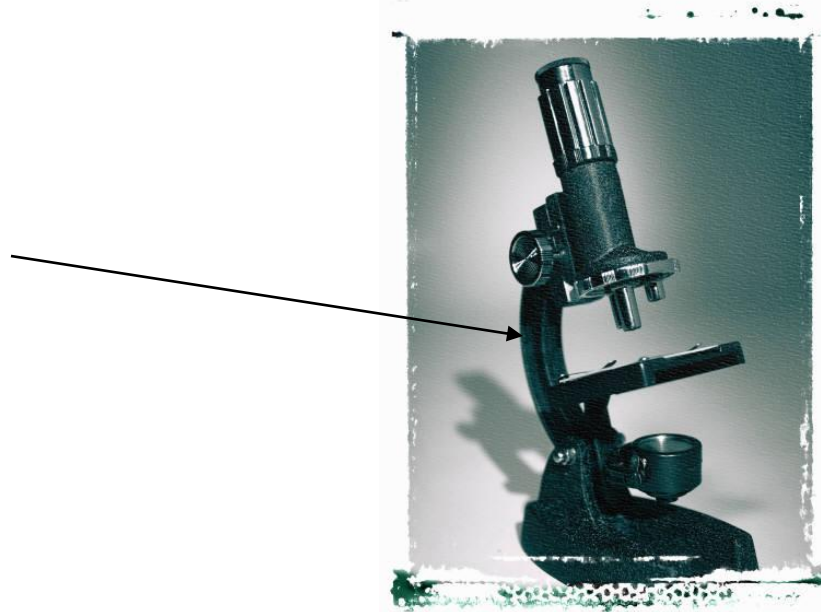
- Magnifies the specimen image



Diagram

Arm

- Used to support the microscope when carried. Holds the body tube, nose piece and objective lenses



Diagram

Stage

- Supports the slide/specimen



Diagram

Coarse Adjustment Knob

- Moves the stage up and down (quickly) for focusing your image



Diagram

Fine Adjustment Knob

- This knob moves the stage SLIGHTLY to sharpen the image



Diagram

Base

- Supports the microscope



Diagram

Magnification



Magnification

- process of enlarging something only in appearance



Magnification

- To determine your magnification...you just multiply the ocular lens by the objective lens
- Ocular 10x Objective 40x: $10 \times 40 = 400$



So the object is 400 times “larger”

Objective Lens have their magnification written on them.

Ocular lenses usually magnifies by 10x

Caring for a Microscope

- Clean only with a soft cloth/tissue
- Make sure it's on a flat surface
- Don't bang it
- Carry it with 2 HANDS...one on the arm and the other on the base

Carry a Microscope Correctly



Using a Microscope

- Start on the lowest magnification
- Don't use the coarse adjustment knob on high magnification...you'll break the slide!!!
- Place slide on stage and lock clips
- Adjust light source (if it's a mirror...don't stand in front of it!)
- Use fine adjustment to focus

- <http://>

