

TOOLS AND PROCEDURES



THINK ABOUT THIS...

Imagine being one of the first people to see living things through a magnifying glass.

•Share an experience of how surprised are you when you view an object or organism under the magnifying glass?

•Can technology solve all problems?

•Could there still be other types of life that remain undiscovered today because the right tools are not available?



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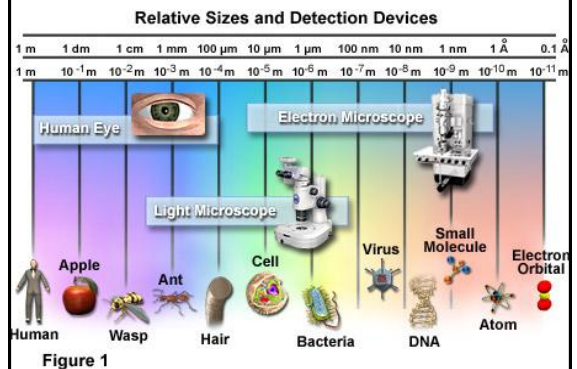
OBJECTIVE:

After the discussion you are expected to;

- Describe some important biological processes and the tools utilized in their study;
- Compare and contrast two biotechniques by using a chart.

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What You Can and Cannot See



Optical Instruments

1. [Simple Microscope](#)
2. [Compound Microscope](#)
3. [Electron Microscope](#)

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Microscope History

Zacharias Janssen developed the **first simple microscope** about 1590.



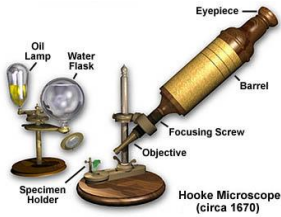
The First Compound Microscope (circa 1595)

3x - 10x magnification

Microscope History

**Robert Hooke
(about 1665)**

Poor lens quality.



Hooke Microscope (circa 1670)

Microscope History

**Anton van Leeuwenhoek
(about 1683)**

Simple but good.

Superior magnification and resolution compared to other microscopes.



Leeuwenhoek Microscope (circa late 1600s)

70x - 250x

Microscope History

Improvements continued in the 1700s



Cuff's Microscope (circa mid 1700s)

45x - 100x



George Adams' Universal Double Microscope (circa 1746)

Multiple Lenses



Jones' Most Improved Compound Microscope (circa late 1700s)

Simple / Dissecting Microscope



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- Used in studying the surface of external structures of specimens.

Microscope History

Compound Microscope

- Light passes through lenses to magnify image up to 1000X
- Can observe living cells

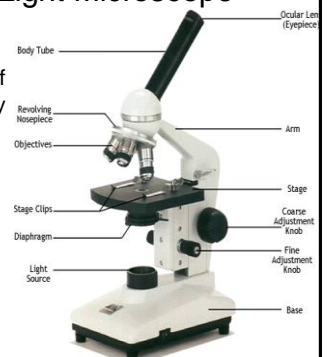


Zeiss Laboratory Microscope (circa 1930)

100x - 1000x

Compound Light Microscope

- Make use of natural or ordinary light



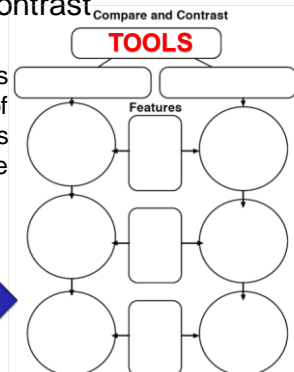
Electron Microscope

- Make use of magnets to beam electrons
- Kills cells being observed
- 1000x-200,000x magnification power



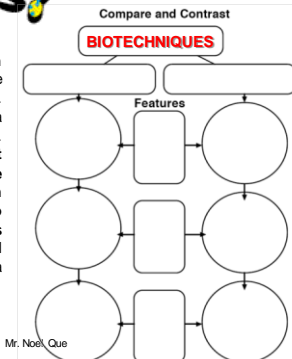
Compare and Contrast

- List 3 similarities and differences of a Magnifying Lens and a Microscope using this chart.



Try This!

- After giving a demonstration of how to go about the **compare and contrast chart**. Each team will be given a **Manila paper** and a **marker**. Assemble and **copy the chart** again before we **go to the library**. The task is listed on the next slide for your team to **research**. After **20 minutes** your **poster** will be displayed around the classroom for a **gallery walk**.



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Try This!

Biotechniques:

- T1- Sectioning & Mounting
- T2- Staining & Fixing
- T3- Microdissection & Bacterial Reproduction
- T4- Centrifugation & Chromatography
- T5- Microscopy & Dissecting
- T6- Cell Culture & Cell fractionation

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SYNTHESIS:

At the end of your poster, **copy and answer the question** below:

- **What traits should be developed among scientists in using the instruments & techniques necessary in their scientific studies?**

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HOMEWORK:

1. Photocopy Science, Environment, Technology and Society. SIBS Publishing House Inc., Quezon City, 2010. Pp 6-11.
2. Bring also the following materials for our next lab activity: Art materials, Cartolina and Magazines

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