

Masters for transparencies

5.1 Term 1

materie en materiale

Eliminasie-reaksie

- Dehidrohalogenering
Hitte; basis opgelos in etanol → Alkeen + water + haliedsout
- Dehidrering
Hitte; swewebuur → Alkeen + water
- Terniese kraging
Toestand: hoë temperatuur; hoë druk; geen katalisator → Mengsel van alkene vorm.
- Katalitiese kraging
Laer temperatuur; 'n katalisator; gematigde las druk → Kort ketting alkene vorm.

1.7.2.1 Dehidrohalogenering

Reaksie-toestand:
Temperatuur: Word sterk verhit;
Toerewordig: Stank bakke; NaOH of KOH in suiver etanol opgelos; warm etanoliese NaOH of KOH.
Produk: Alkeen + water + H₂

$\begin{array}{c} \text{---C---C---} \\ | \quad | \\ \text{H} \quad \text{Y} \end{array}$

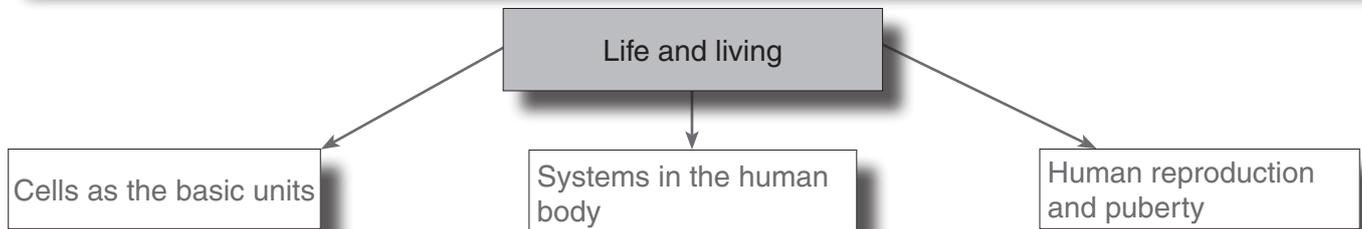
Voorbeelde:

$\begin{array}{c} \text{H} \quad \text{H} \\ | \quad | \\ \text{H---C---C---H} \\ | \quad | \\ \text{H} \quad \text{Br} \\ \text{bromostaan} \end{array} + \text{Na---O} \xrightarrow[\Delta]{\text{stans}} \begin{array}{c} \text{H} \quad \quad \text{H} \\ \quad \backslash \quad / \\ \text{C} = \text{C} \\ \quad / \quad \backslash \\ \text{H} \quad \quad \text{H} \\ \text{eteen} \end{array} + \text{Na---Br} + \text{H---O}$

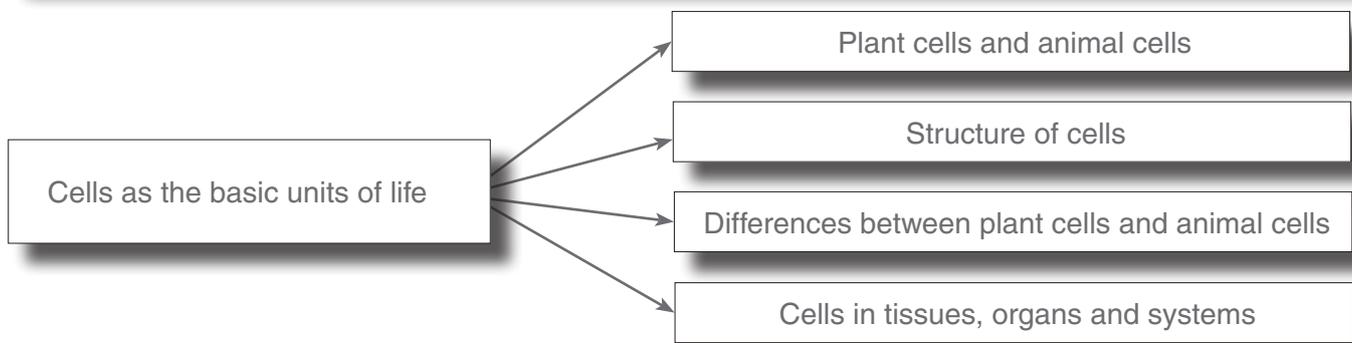
196 CHEMIE voorbereidingsêër - Graad 12 Oos-Botswana



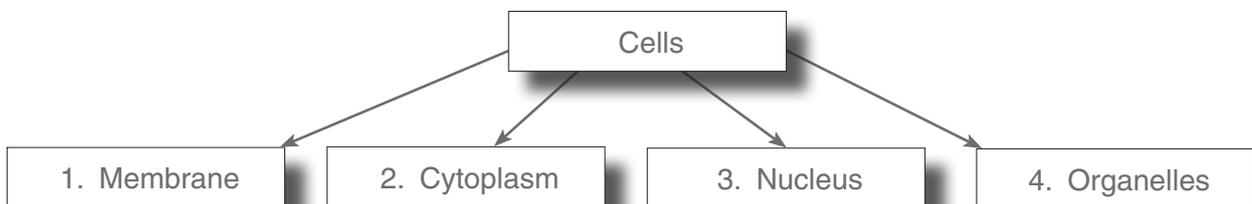
TERM 1: LIFE AND LIVING



UNIT 1 CELLS AS THE BASIC UNITS



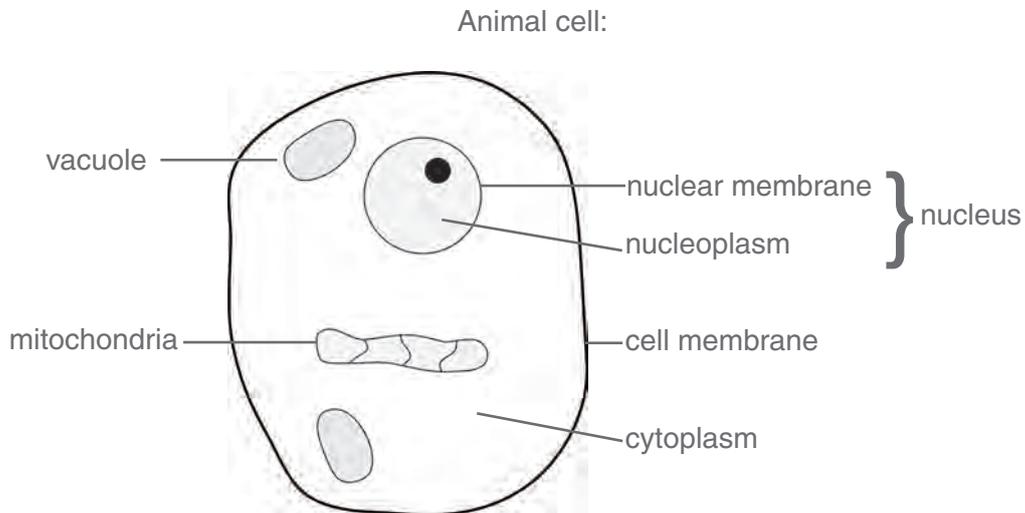
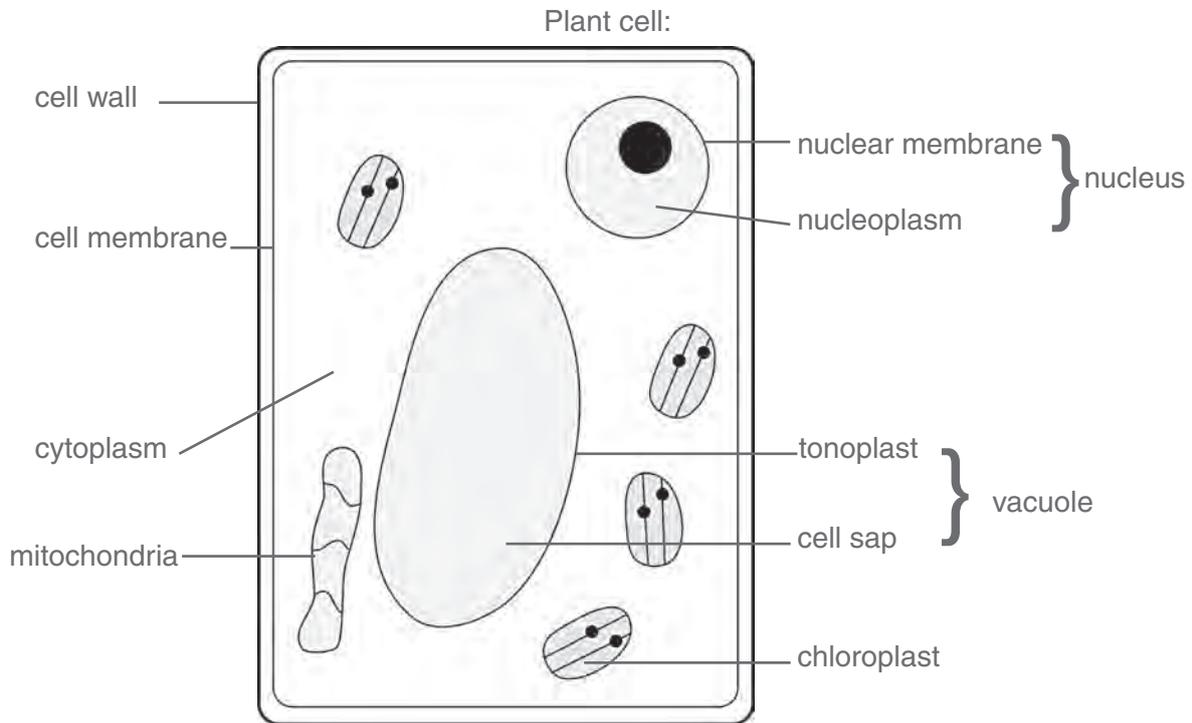
1.1 Plant cells and animal cells



1. Membrane:
 - Surrounds the cell.
 - Allows certain substances to move in and out.
 - Living, thin and pliable
2. Cytoplasm:
 - Chemical processes take place.
 - Jelly-like substance.
3. Nucleus (core):
 - Surrounded by the nucleus membrane.
 - Contains the DNA
 - DNA contains hereditary characteristics
 - Controls the life functions and processes of the cell.
4. Organelles:
 - Include mitochondria and vacuole.
 - Mitochondria is responsible for respiration in cells, and release energy.



1.2 Structure of cells



1.3 Differences between plant cells and animal cells

		Plant cell	Animal cell
1.	Cell wall	Present	Not present
2.	Shape of cell	Inflexible and firm	No fixed form
3.	Vacuole	Large vacuoles	Small vacuoles
4.	Chloroplast	Only found in green plants.	Do not contain



Project: Page 15

- Build a 3D plant cell that meets the following requirements:
- It must be approximately the size of an A4 paper.
 - Be as creative as possible.
 - Use different kinds and colours of sweets, play dough, different colours of cardboard or anything from nature to represent the different parts of the cell.

1.4 Cells in tissues, organs and systems

Activity 1: Page 15

Do research and write a report about the history and discovery of light microscopes and electron microscopes.

Look for pictures.

Make a poster.

Do a presentation in class.

The following can be used as guideline for the marking of this task.

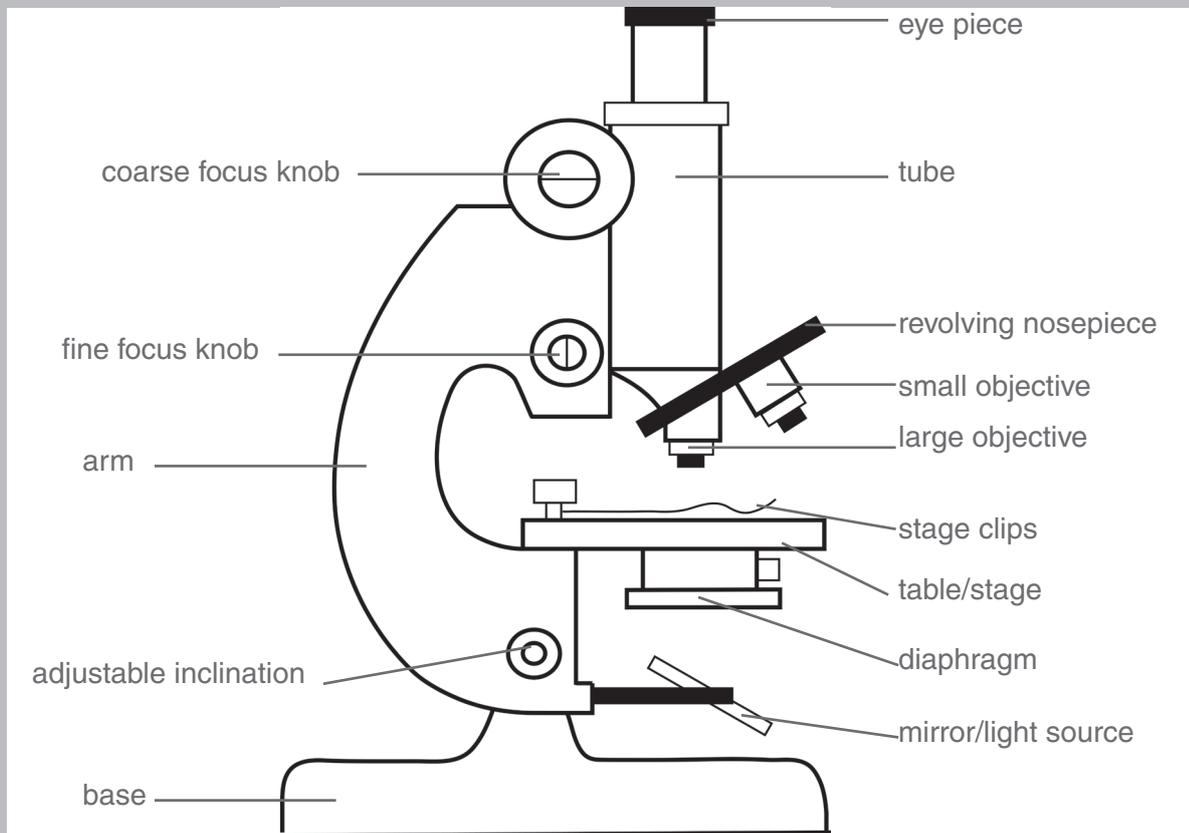
Period	Inventor/Description
14 th century	In Italy the grinding of lenses is developed as an art form. It is used as spectacles to improve sight.
1590	Two opticians (Zacharias Janssen and his father, Hans) experiment with lenses by placing seven of them in a tube. This way they learn that they can enlarge an item much more than with a magnifying glass.
1667	Robert Hooke uses his compound microscope (microscope with more than one lens) and records his findings.
1675	Anton van Leeuwenhoek spends a lot of time to learn how to sharpen and polish lenses. He creates a microscope that can enlarge items 270 times. He is the first person to observe bacteria, yeast and blood cells, and is named the father of the microscope.
18 th century	The microscope is improved and becomes easier to handle. The instrument is used more and more by scientists.
1903	Richard Zsigmondy develops an ultramicroscope and is able to observe objects smaller than the wavelength of light.
1932	Frits Zernike develops the phase-contrast microscope which enables him to observe colourless and transparent biological cells.
1938	Ernst Ruska develops the electron microscope. The use of electrons in microscopes improves the resolution and it broadens the limits of discovering and research.
1981	Gerd Binnig and Heinrich Rohrer develop the scanning tunnel microscope which gives three dimensional images of the cells that are studied.





Activity 2: Page 16

Study the labelled sketch of the basic light microscope.



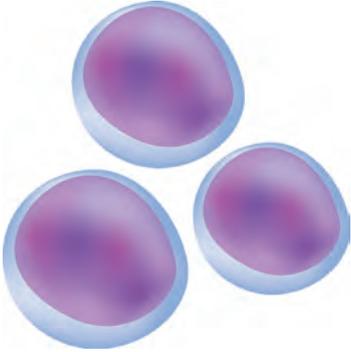
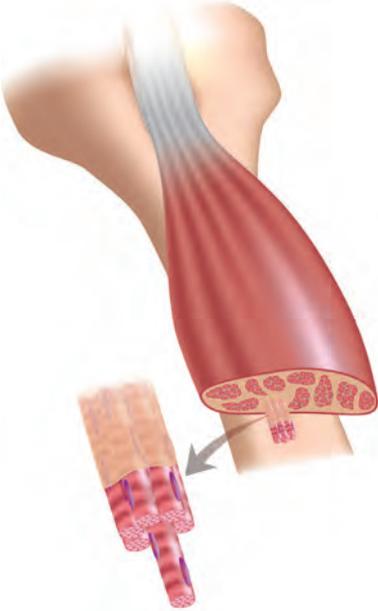
Complete the table below about the function of each of the parts that are listed.

Part	Function
Eye piece	The lens to which you hold your eye and which enlarges the object to be observed.
Tube	The tube keeps the lenses of the eye piece and the objectives at the correct distance from each other.
Coarse focus	Used to move the tube upward and downward until the object that is studied is seen.
Fine focus	Used to obtain a clear image of the object.
Arm	Connects the base and the stage. It also serves as support for the focuses.
Revolving nosepiece	It supports and holds the objective.
Objectives	Lenses in the objectives are used to enlarge the image of the object.

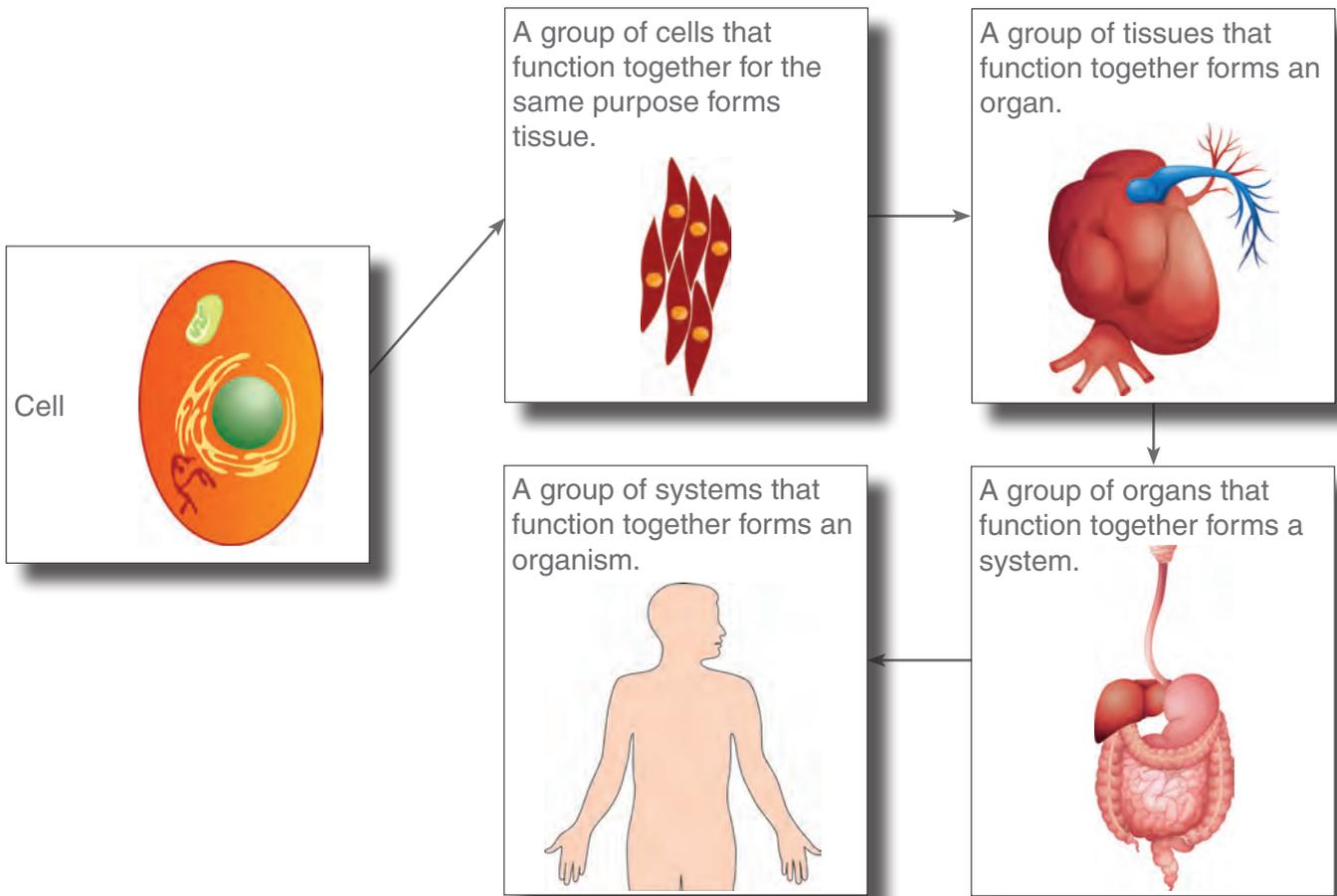


Part	Function
Table/stage	Supports the microscope slide over the opening which allows light through from the light source.
Stage clips	Clamps the microscope slide.
Diaphragm	Controls the amount of light that moves to and through the object. It also focuses the light rays from the light source.
Light source	Reflects light upwards to the opening of the stage.
Base	The solid base which supports the microscope.

Few examples of specialised cells:

Cell	Function
<p>Stem cells</p> 	<p>Nerve cells</p> 
<p>Muscle cells</p> 	<p>Red blood cells</p> 





Case study: Page 19

Stem cells and stem cell research

Questions:

1. What is a stem cell?

A cell that can develop into any other cell and that can self-regenerate.

2. What is an embryo?

An unborn baby during the first eight weeks after fertilisation that has not developed any organs yet.

3. What is stem cell research?

It is research that is done on the stem cells of embryos with the intention of curing diseases like Alzheimer's and Parkinson's.

4. Why was stem cell research hailed as a miracle cure by the medical fraternity?

Because it may hold the solution to incurable diseases such as Alzheimer's, cancer and Parkinson's.



5. Which two ethical questions caused controversy in the debate about stem cell research? State your answer in just one sentence.

It is murder to do research on embryos.

Stem cell research may pave the way for inhumane practices such as the cloning of babies, and embryo farms.

6. Give your own opinion of stem cell research. Do you agree with it or not?

Any answer is acceptable, if the motivation is valid.

Do further research about stem cell research to support your answer to Question 6.

Discuss your findings in class.

Take into consideration that stem cells can also be obtained from blood from the umbilical cord after birth.

How does this statement influence your opinion?

With Question 6, give learners the opportunity to discuss the subject and voice their opinions.

Practical task 1: Page 21

Prepare plant cells and animal cells (e.g. cells from an onion and mucous) and study it under a microscope. Draw and name the cells that are studied.

Exercise 1: Page 21

1. Name three specialised cells as well as the function of each.

Muscle cells – make movement possible.

Nerve cells – transport electrical impulses.

Red blood cells – transport oxygen.

2. Explain the following briefly:

Tissue: a group of cells that function together.

Organs: a group of tissues functioning together.

Systems: a group of organs that function together.

Organism: a group of systems functioning together.

3. Name the four parts found in all cells.

Membrane; cytoplasm; nucleus; organelles

4. What is the function of the cell nucleus?

It controls the life functions and processes of the cell.