ACTIVIDAD CLIC:

“MANEJO DEL MICROSCOPIO ÓPTICO COMPUESTO”

NIVEL: 3º ESO

ALUMNO: JULIA GARCIA GALLEGO
UNIDAD: MANEJO DEL MICROSCOPIO ÓPTICO COMPUESTO
<table>
<thead>
<tr>
<th>ACTIVIDAD CLIL</th>
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<td><strong>Nivel /Curso / Year</strong></td>
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| Temporalización / Timing | 1ª Evaluación Unidad "Las células y los tejidos" |

<table>
<thead>
<tr>
<th>Contenidos / Contents</th>
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<tbody>
<tr>
<td>• Conocer el fundamento teórico de un microscopio óptico.</td>
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<tr>
<td>• Conocer y saber identificar las partes de un microscopio óptico</td>
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<tr>
<td>• Conocer el manejo del microscopio óptico</td>
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<td>• Conocer los pasos para realizar una preparación microscópica</td>
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<tr>
<td>• Manejar el vocabulario en inglés los principales conceptos, y términos relacionados con las partes y manejo del microscopio óptico</td>
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<tr>
<th>Recursos / Resources</th>
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<tr>
<td><strong>Espaciales:</strong> Aula con ordenador y pizarra digital, video proyector y conexión a internet, laboratorio</td>
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<tr>
<td><strong>Materiales:</strong> Ficha sobre la práctica de Manejo del microscopio óptico, material de laboratorio: microscopio óptico y materiales para realizar preparaciones,</td>
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<tr>
<td><strong>Temporales:</strong> 2 sesiones de 50’</td>
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<td>- Primera sesión en el aula</td>
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<td>- Segunda sesión en el laboratorio</td>
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<tr>
<th>Objetivos / Goals</th>
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<tr>
<td>• Que los alumnos sean capaces de comprender la función de cada una de las partes de un microscopio óptico.</td>
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<tr>
<td>• Que los alumnos conozcan y pongan en práctica el manejo del microscopio</td>
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<tr>
<td>• Que los alumnos sean capaces de reproducir de forma práctica, los pasos básicos para la realización de una preparación microscópica sencilla a partir de materiales biológicos cotidianos (ej tejido epitelial de la mucosa bucal, epidermis de cebolla...)</td>
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<th>Criterios de evaluación</th>
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<tr>
<td>• Completar un esquema mudo con las partes de un microscopio óptico.</td>
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<tr>
<td>• Indicar que pasos hay que seguir para enfocar una preparación</td>
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<tr>
<td>• Enumerar los pasos para realizar una preparación microscópica</td>
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Sesión 1.

Warm-up: Eliciting.

Ask students if ever they have seen and they have handled an optical microscope

Activity 1: What is a microscope?

Listen to explanation about microscopes, complete text with the concepts that appear before and then try to answer the questions

<table>
<thead>
<tr>
<th>lighting</th>
<th>two</th>
<th>optical</th>
<th>electronics</th>
<th>mechanical</th>
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</thead>
<tbody>
<tr>
<td>lens system</td>
<td>transparent</td>
<td>optical</td>
<td>amplifies</td>
<td>lenses</td>
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"The microscope is an .................instrument that .........................the image of a small object. Through a system of .................and lighting sources a microscopic object can be made visible. Microscopes can increase 100 to hundreds of thousands of times the original size. There are................. types of microscopes: the............... and ......................... In the optical microscope the increase of the object is achieved using a ...................that manipulates light rays passing between the object and the eyes. The electron microscope uses a .........................controlled by a magnetic field. The various elements that exist in nature, present sizes, shapes and different compositions, most of them can be seen, some at first glance, and others through instruments.

The optical microscope (OM) is an instrument that has more than one objective lens. Used to examine objects ......................or very thin slices. It is used to expand or increase the images of objects not visible to the naked eye. The optical microscope consists of three important parts:"

1. ....................... part of the optical microscope
2. Optical part
3. .........................system"
1) What is the function of the microscope?

2) Name two types of microscopes that exist: ......................... and .........................

3) How are microscopes used in the laboratories of the Institute?

4) In which is based the light microscope?

5) Where is the electron microscope based?

6) How should the samples of materials that we observe through the microscope be?

7) Name the three parts that make up an optical microscope
Activity 2: Identifying the parts of a microscope

Carefully read each of the definitions of the parts of a microscope and try to find them in the schema that appears in the next sheet.

1) **Mechanical parts of microscope**: Holding the part of illumination and optical, and besides they allow movements necessary for the approach to the object
   a. **Base or foot**: is the bottom of the microscope which allows this to continue standing.
   b. **Tube**: It is the camera obscura which carries the eyepieces and objectives.
   c. **Arm**: It is the structure that holds the tube, plate and screws of approach associated with the tube or the deck.
   d. **Revolver**: It is the system that carries the objectives of different magnifications, and rotating in order to use one or the other, aligning them with the eyepiece.
   e. **Tornillos macro and micrometric**: they are screws of focus, move the deck or the tube up and down. The coarse allows for an initial focus displacement and the micrometric very short trips, for the more accurate approach.
   f. **Deck**: It is a horizontal platform with a central hole, which is placed on the preparation, allowing the passage of rays coming from the source of light located below.
   g. **Clamps**: are two metal pieces that hold the object. They are in the deck.

2) **System Opticalis**: responsible for play and increase the images using the set of lenses that comprise it. It is formed by the eyepiece and objectives. The lens projects an image of the sample to the eyepiece then expands.
   a. **Eyepiece**: lens close to the eye of the beholder. It captures and expands the image formed in the objectives.
   b. **Objective**: they are arranged in a rotating piece called revolver produce images of objects and bodies increase and, therefore, are near the preparation are examined.

3) **Lighting system**: directs the light so that it illuminates the preparation or object properly.
   a. **Condenser**: lens that focuses light rays on the preparation.
   b. **Diaphragm**: This associate to the condenser and regulates the amount of light that reaches the condenser.
Sesión 2

Warm-up: Eliciting.

Are students asked to comment all those parts of the microscope that recall after the activity that they carried out in the classroom.

Activity 1: Remembering and identifying parts of the optical microscope

1) We will see a video to remember the parts of a compound optical microscope:
   https://www.youtube.com/watch?v=HOhf7LaunOys
   https://www.youtube.com/watch?v=RKA8_mif6-E

2) Each pair of students will be an exercise in identification of the parts of the microscope. One of the students will be naming a part of the microscope using the scheme completed in the classroom and the other student must declare on the microscope where the part is located.

When the student has identified all the parts of the microscope, they will repeat the activity changing students.

Activity 3: Learning to focus preparation

1) Listen carefully to the following video about the steps that you must follow to observe microscopic preparation:

   https://www.youtube.com/watch?v=s58pMXzYksc
2) Performs the following activity to analyze as the images seen through an optical microscope

a) Draw one and lowercase within one of the squares of graph paper

b) Place the paper on the microscope stage and focuses on the preparation

c) It draws in the next box you see through the eyepiece

d) Move to the right preparation and observed through the eyepiece. Where to move the preparation?

e) Move the preparation to the left and look through the eyepiece. Where to move the preparation?

f) Moves the preparation up and look through the eyepiece. Where to move the preparation?

g) That conclusions you can draw from the observations?
3) Below are these steps, but they are messy: points out, putting the number that apply to you, the order in which this procedure must be done.

_____. Tune the image slowly moving the micrometric screw.
_____. Slide the tube of the microscope by means of coarse screw, noting laterally until the objective is near the slide.
_____. If you are using the object of immersion (100 X) place a drop of immersion oil on the preparation and low the microscope tube until the objective lens touch to drop, notes and adjusted carefully after use clean the lens with a soft tissue (silk paper).
_____. Place the slide on the microscope stage.
_____. See through the eye slowly turn up the tube of the microscope to observe the preparation focused, not get off the tube of the microscope while he is watching, because you can get to hit the target with the slides and cause malfunction.
_____. If you want to further increase, turn the revolver to the adequate object.
____. Use the aim of smaller increase

4) Determines the total gain with're looking it if you use the combination of eyepiece and objective shown in the following drawing:

Increase of the eyepiece: _________
Increase of the objective: _________
Total gain: _______
Activity 4: See your own cells

a) Take a sample of the oral mucosa of the mouth with the help of a toothpick. So just stick through the inside of the cheek.

b) Extend the sample on the slide with the stick. Make a smear.

c) Fix the sample from it over the flame of the burner, with care to avoid burning. It is a fixation with heat.

d) Cover the sample with methylene blue. Leave for two minutes.

e) Wash the sample with water leaving it fall gently with the help of a wash-bottle to remove coloring.

f) Cover with a coverslip and press carefully.

g) Observe under the microscope, first with minimal increases, then move to larger increases.
h) Draw, indicating increases.

1. Which of the following drawings represents best what you see?

![Images of different cell structures]

2. You must perform a drawing of some cells and points observed structures on them.

![Blank circle for drawing]

3. Why you use methylene blue?
Nota: imágenes de I.E.S. Rosa Chacel. Departamento de Biología y Geología