7

DepED
DEPARTMENT OF EDUCATION

Lesson Exemplar for Science

Quarter 2
Lesson
1

Lesson Exemplar for Science Grade 7
Quarter 2: Lesson 1 (Week 1)
S.Y. 2024-2025

Development Team

Writer:
- Kristine N. Busmion (Siliman University)

Validator:
- Genelita S. Garcia (Philippine Normal University)

Management Team

Philippine Normal University
Research Institute for Teacher Quality
SiMMER National Research Centre

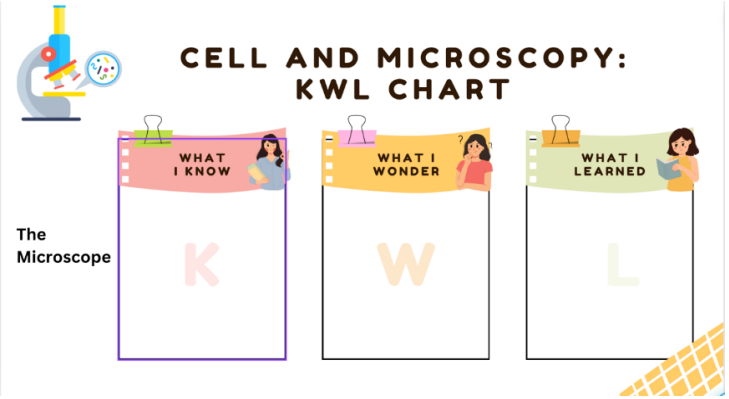
SCIENCE (BIOLOGY) / QUARTER 2 / GRADE 7

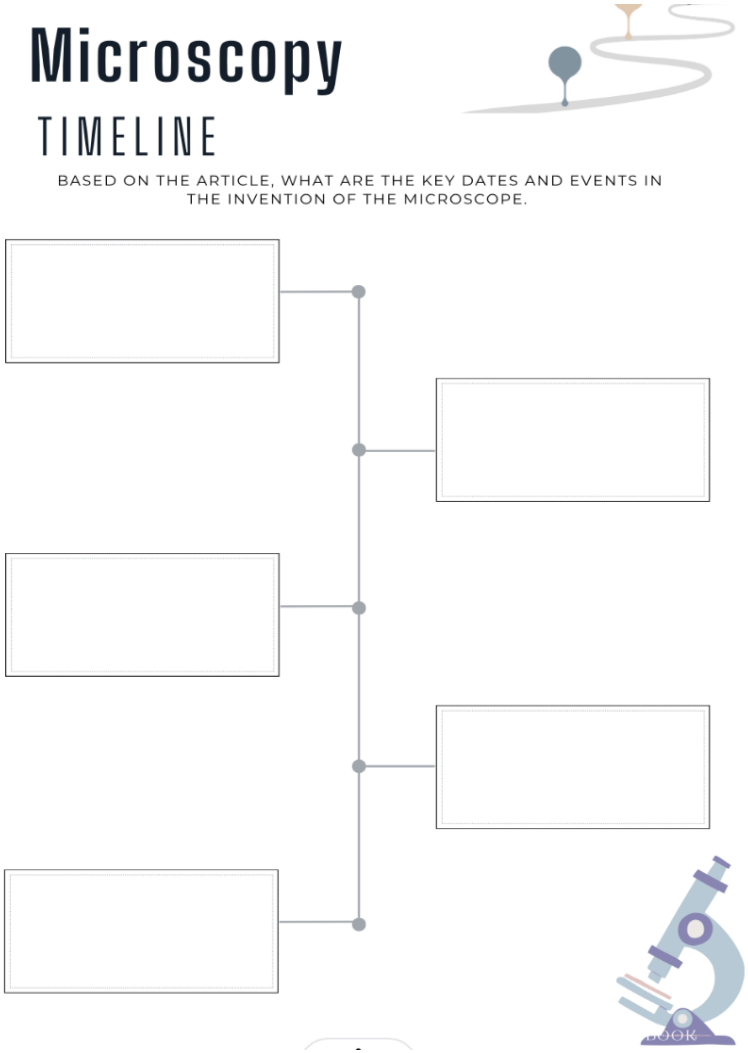
I. CURRICULUM CONTENT, STANDARDS, AND LESSON COMPETENCIES	
1. Content Standards	1. Familiarity and proper use of a compound microscope are essential to observe cells. 2. The organelles of plant and animal cells can be identified using a compound microscope. 3. Cells are the basic unit of life and mitosis, and meiosis are the basic forms of cell division.
2. Performance Standards	*By the end of the Quarter*, learners will be able to create a visual representation, such as poster, model, or e-poster, explaining the trophic level in a chosen ecosystem.
3. Learning Competencies and Objectives	**1. Identify the parts and functions, and demonstrate proper handling and storing of a compound microscope** *Lesson Objective 1: Identify the parts of a compound microscope and the function of each part.* *Lesson Objective 2: Demonstrate the proper handling and storing of a compound microscope* **2. Use proper techniques in observing and identifying the parts of a cell with a microscope such as the cell membrane, nucleus, cytoplasm, mitochondria, chloroplasts, and ribosomes** *Lesson Objective 1: Use proper techniques when observing the parts of a cell under a microscope.* *Lesson Objective 2: Identify the parts of a cell, such as the cell membrane, nucleus, and cytoplasm, with a microscope* **3. Differentiate plant and animal cells based on their organelles** *Lesson Objective 1: Identify the parts of a plant cell and the function of each.* *Lesson Objective 2: Identify the parts of an animal cell and the function of each.* *Lesson Objective 3: Compare and contrast plant and animal cells based on their organelles.* ***4. Recognize that some organisms consist of a single cell (unicellular) like in bacteria and some consist of many cells (multicellular) like in a human*** *Lesson Objective 1: Describe unicellular and multicellular organisms* *Lesson Objective 2: Identify examples of unicellular and multicellular organisms*
4. Content	1. Science equipment: The Compound Microscope ● Parts and Functions ● Using of Microscope 2. Plant and animal cells

	• Parts and Functions • Similarities and Differences
5. Integration	• Utilization of a microscope in investigating microorganism and their roles in the ecosystem • Distribution of plant and animal cells relating to global diversity patterns • The intricate pattern of plant and animal cells for inspiration for artistic pieces

II. LEARNING RESOURCES

- Banks, P. (2019). How to use a Microscope - Microscopes 4 Schools. Cam.ac.uk. https://www2.mrclmb.cam.ac.uk/microscopes4schools/microscopes2.php
- FuseSchool. (n.d.). How to use a Microscope | Cells | Biology | FuseSchool. https://www.youtube.com/watch?v=xzjowD1KN20&t=17s&ab_channel=FuseSchool-GlobalEducation
- Take a Real Close Look at This History of Microscopes (2019). ThoughtCo. https://www.thoughtco.com/microscopes-timeline-1992147
- Microscope master. (2019). Onion Cells Under the Microscope - Requirements, Preparation and Observation. MicroscopeMaster. https://www.microscopemaster.com/onion-cells-microscope.html
- Microscope.com. (n.d.). How to Use a Compound Microscope. Microscope.com. https://www.microscope.com/how-to-use-a-compound microscope
- Molnar, C., & Gair, J. (2019). 1.1 Themes and Concepts of Biology – Concepts of Biology-1st Canadian Edition. Opentextbc.ca. https://opentextbc.ca/biology/chapter/1-1-themes-and-concepts-of-biology/
- Parts of a Microscope. (2021, February 6). SmartSchool Systems. https://smartschoolsystems.com/parts-of-a-microscope-2/
- Science Museum. (2019, August 19). The Microscope. Science Museum. https://www.sciencemuseum.org.uk/objects-and stories/medicine/microscope
- SiouxScience. (n.d.). How to properly use a compound light microscope. https://www.youtube.com/watch?v=PKDj1x3iyP4&ab_channel=SiouxScience
- Virtual Microscope | NCBioNetwork.org. (2021, October 27). Www.ncbionetwork.org. https://www.ncbionetwork.org/educational resources/elearning/virtual-microscope

III. TEACHING AND LEARNING PROCEDURE		NOTES TO TEACHERS
A. Activating Prior Knowledge	**Short Review** Poem Analysis: Look for a partner and study the Acrostic below. Answer the process questions. "Magnify the unseen world, Intricate details unfurled. Cells and creatures, big and small, Revealed beneath the lens, we call. Observing life in its tiny scope, Scientific wonders, giving hope. Concealed mysteries, now clear, Optical marvels bring them near. Patterns, structures, come alive, Exploring realms that thrive." **Process Questions:** 1. What scientific instrument is described in the poem? 2. What is the significance of the phrase "scientific wonders, giving hope"? **KWL Chart:** Using the graphic organizer, the students will recall their prior knowledge about the given terms. The learners will only answer K and W at this point.  	The lesson will start with a Poem Analysis that the students will answer. After reading the acrostic, the students will work in pairs and answer the process questions. **Answer Key:** 1. Microscope 2. (Answers vary.) It highlights the impact of microscopes in advancing scientific knowledge and fostering optimism for future discoveries. At this point, the students already have an idea of what the lesson is all about. Using the graphic organizer, the students will write what they know and what they wonder about The Microscope. This KWL Chart will be revisited at the end of the lesson to answer the column on what they have learned about the different concepts.

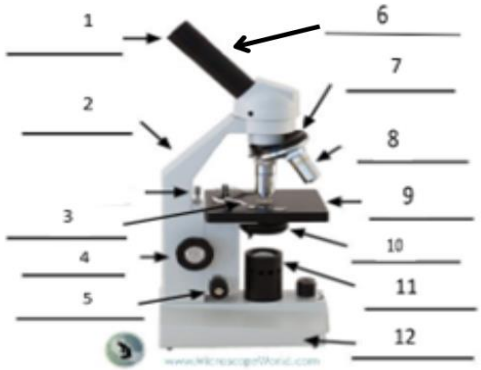
B. Establishing Lesson Purpose	**Lesson Purpose** **Microscopy Timeline:** The students will read the material on the timeline of the microscope. Using the graphic organizer, plot the advancements of the microscope in the early years.  	The lesson proper will start with establishing the timeline of the discovery of the microscope. The students will read the article History of Microscopes Key Dates on the Timeline of the Microscope in https://www.thoughtco.co m/microscopes-timeline 1992147. **Answer key:** 1000 CE unidentified inventor reading stone 1284 Italian Salvino D' Armate first pair of wearable eyeglasses 1590 Dutch eyeglass craftsmen Zacharias Janssen and his son Hans Janssen telescope and compound microscope 1665 English physicist Robert Hooke Discovered in a cork using the microscope lens the "pores" or "cells"

	Unlocking Content Area Vocabulary **Table Completion: Complete table by providing the descriptions of the given terms.** 1. Magnification 2. Resolution 3. Illumination 4. Stage 5. Objective Lens 6. Eyepiece (Ocular)	1674 Anton van Leeuwenhoek basic microscope equipped with a single lens used to observe blood, yeast, insects, and a wide array of minuscule specimens **Answer Key:** **Term** / **Description** Magnification: The factor by which a microscope enlarges an image. It is calculated by multiplying the magnification of the objective lens by the magnification of the eyepiece. Resolution: the ability of a microscope to distinguish two close points as separate entities. It determines the level of detail and clarity that can be observed in the microscopic image. Illumination: The light source used to illuminate the specimen. It can be from a built-in light source, a mirror, or an external light. Stage: The platform on which the specimen is placed for observation. It often includes a mechanical stage with controls to move the specimen precisely. Objective Lens: The primary lens in a compound microscope that is closest to the specimen and responsible for magnifying the image. Eyepiece (Ocular): The lens at the top of the microscope that you look through to observe the specimen. It further magnifies the image produced by the objective lens.
C. Developing and Deepening Understanding	**SUB-TOPIC 1: MICROSCOPY** **1. Explicitation** **The Microscope Anatomy:** Given a set of terms (parts of the microscope), the students will identify the function of its parts.	The development of subtopic on Microscopy will start with the identification of the parts of the microscope. An actual microscope, an illustration, or the activity sheet, may be used so students can identify the parts.

Microscope Anatomy

LABEL THE PARTS

LABEL THE PARTS OF THE MICROSCOPE.



WRITE THE PARTS OF THE MICROSCOPE IN THE CORRESPONDING NUMBER.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____

Microscope Anatomy Label the Parts Key

The different parts are as follows:

1. Eyepiece
2. Arm
3. Stage clips
4. Coarse Adjustment Knob
5. Fine Adjustment Knob
6. Draw Tube
7. Revolving Nosepiece
8. Objective
9. Stage
10. Diaphragm
11. Illuminator
12. Base

After labeling the parts of the microscope, function of the corresponding parts is also identified.

Microscope Anatomy

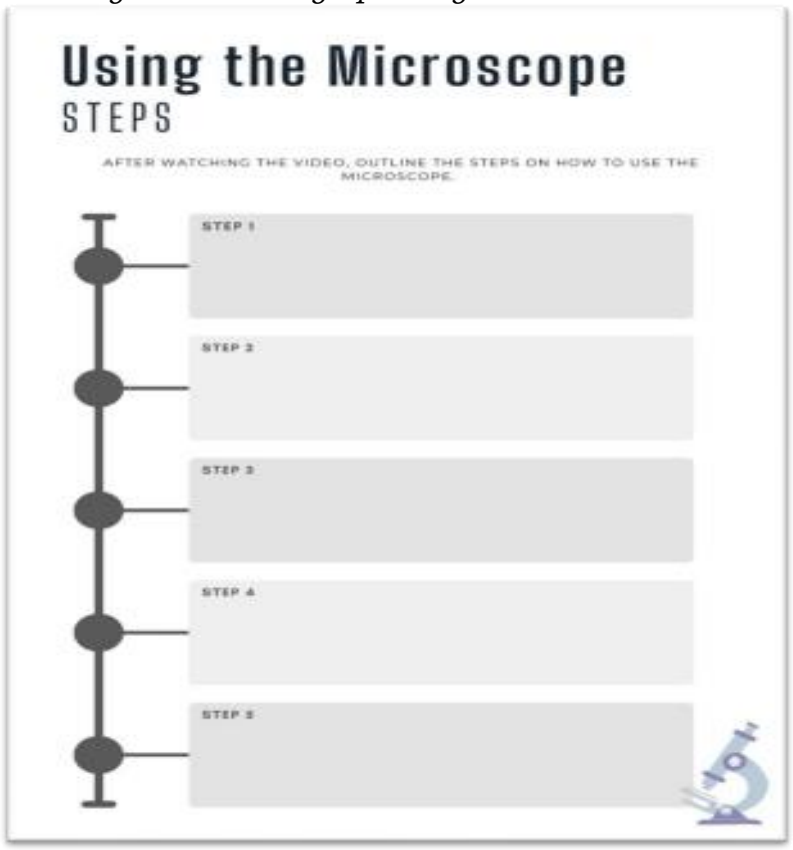
PARTS AND FUNCTIONS

IDENTIFY THE FUNCTIONS OF THE PARTS OF THE MICROSCOPE.

Parts	Functions

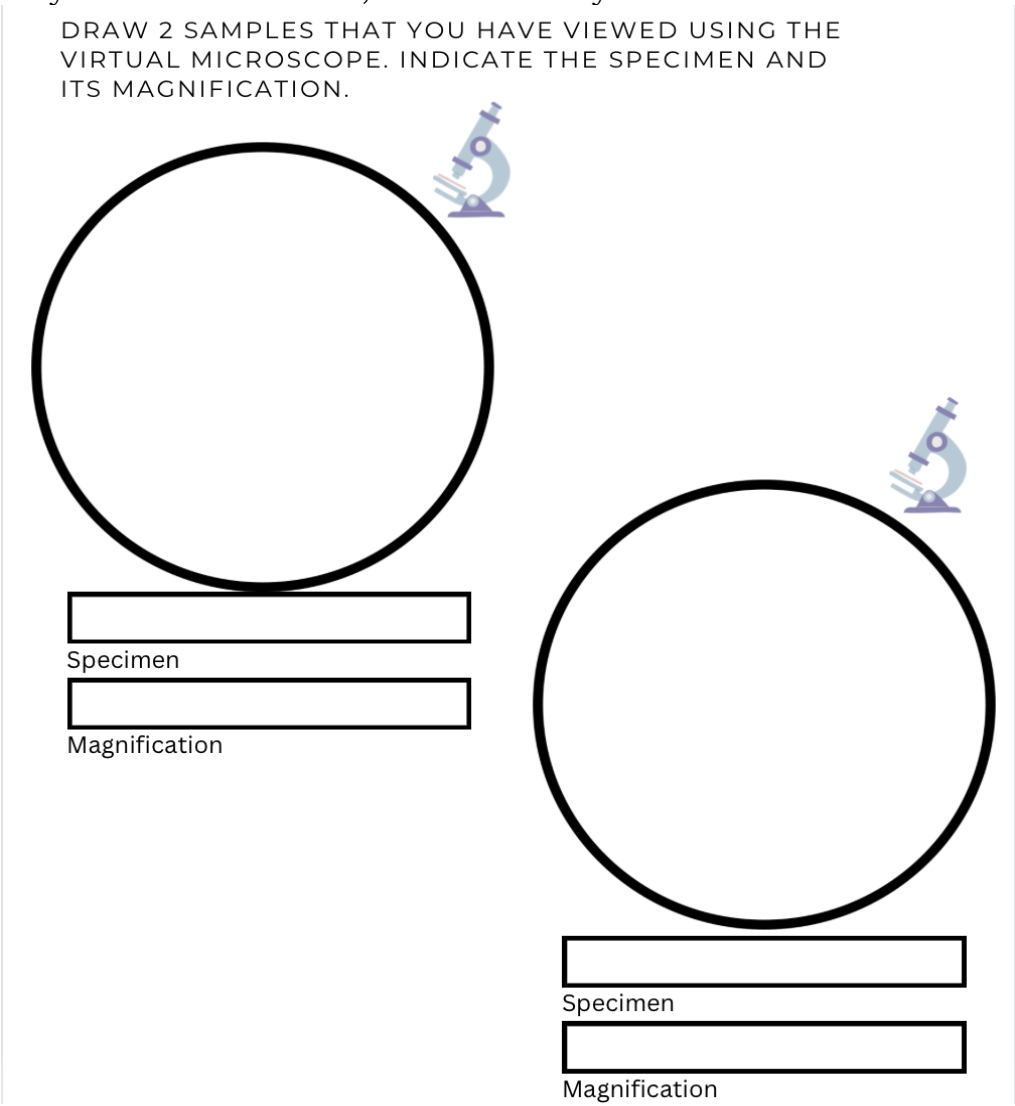
Parts of a Microscope and their functions

- *Eyepiece (Ocular Lens):* The lens at the top of the microscope that you look through, usually with a magnification of 10x or 15x.
- *Arm:* The part of the microscope that connects the base to the head and the eyepiece tube. It is used to carry the microscope.
- *Stage Clips:* Metal clips on the stage that hold the slide in place.
- *Coarse Adjustment Knob:* A larger knob used for focusing the microscope. It moves the stage or the body tube up and down to bring the specimen into general focus.
- *Fine Adjustment Knob:* A smaller knob used for fine-tuning the focus of the specimen after using the coarse adjustment knob. It moves the stage slightly to sharpen the image.
- *Draw Tube:* The tube that connects the eyepiece to the microscope body.
- *Revolving Nosepiece:* The part that holds two or more objective lenses and can be rotated to easily change power (magnification).
- *Objective:* The lenses closest to the specimen, that are typically of varying magnifications (e.g., 4x, 10x, 40x, 100x).

	• *Stage:* The flat platform where the slide is placed for observation. • *Diaphragm (Iris):* A rotating disk under the stage with different sized holes. It is used to vary the intensity and size of the cone of light that is projected upward into the slide. • *Illuminator:* A light source located at the base of the microscope. • *Base:* The bottom part of the microscope that provides stability and support. It houses the illuminator and other electrical components. **Create the Storyline:** Using the graphic organizer, summarize the steps in using the microscope. *Teacher may use another graphic organizer.*  	When the students identify the parts and functions of a microscope, they are now ready to manipulate it. Before actually manipulating the microscope, the students will watch the video entitled How to use a Microscope | Cells | Biology | FuseSchool in: https://www.youtube.com/watch?v=xzjowD1KN20&t=17s The students will create a storyline on how to use the microscope then with the actual manipulation of a microscope is available for use by students.

2. Worked Example

Virtual Microscope: The students will practice using the microscope online. Snips of the final image may be submitted online, or illustrated by the students



If a microscope is unavailable, the students may visit the virtual microscope website by BioNetwork at https://www.ncbionetwork.org/educational resources/elearning/virtual-microscope.
A snip of the specimen viewed or a drawing of the specimen may be reflected on an activity sheet with the corresponding magnification.

Here are the different samples that the students can choose from:

- Sample Slides
- Plant Slides
- Animal Slides
- Bacteria Slides

3. Lesson Activity

Microscope Scavenger Hunt: The students will use the microscope and accomplish as many tasks as they can. They will also illustrate the images that they are able to view.

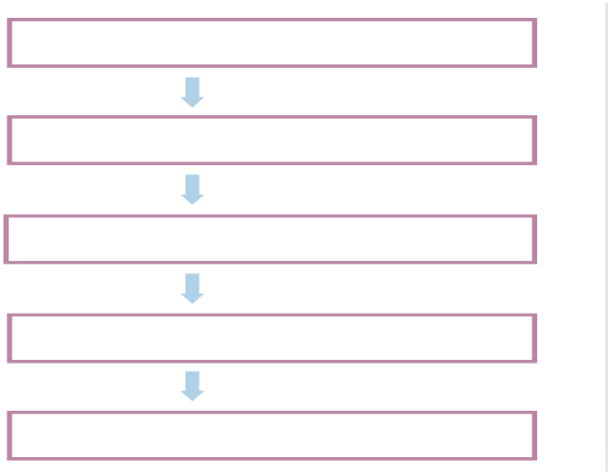
LOOK AT THE LIST OF ITEMS AND VIEW THEM THOUGH THE MICROSCOPE. USE THE LOWEST POWER MAGNIFICATION. CHECK THE ITEMS YOU HAVE VIEWED AND ILLUSTRATE WHAT YOU HAVE SEEN THROUGH THE MICROSCOPE.

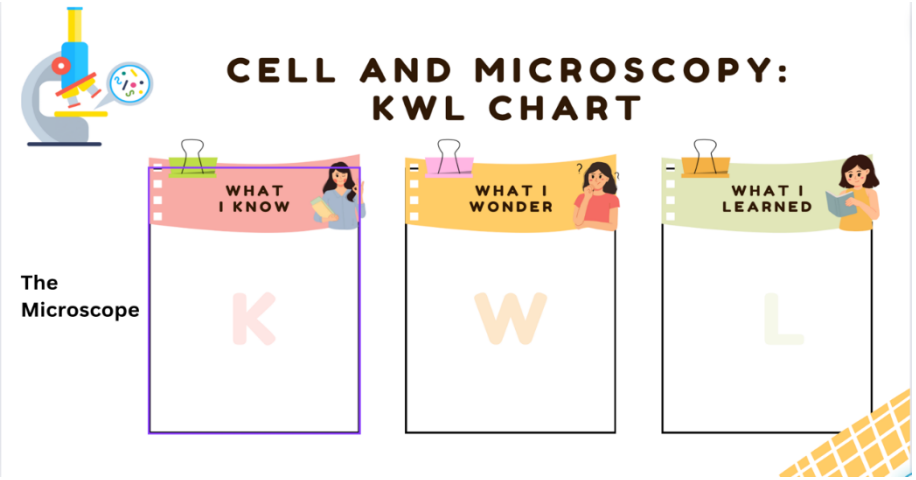
Letter “e” cutout from a newspaper	Letter “b” cutout from a newspaper	Letter “d” cutout from a newspaper
A strand of hair	Colored cutout portion of a newspaper	Cutout of a handwriting

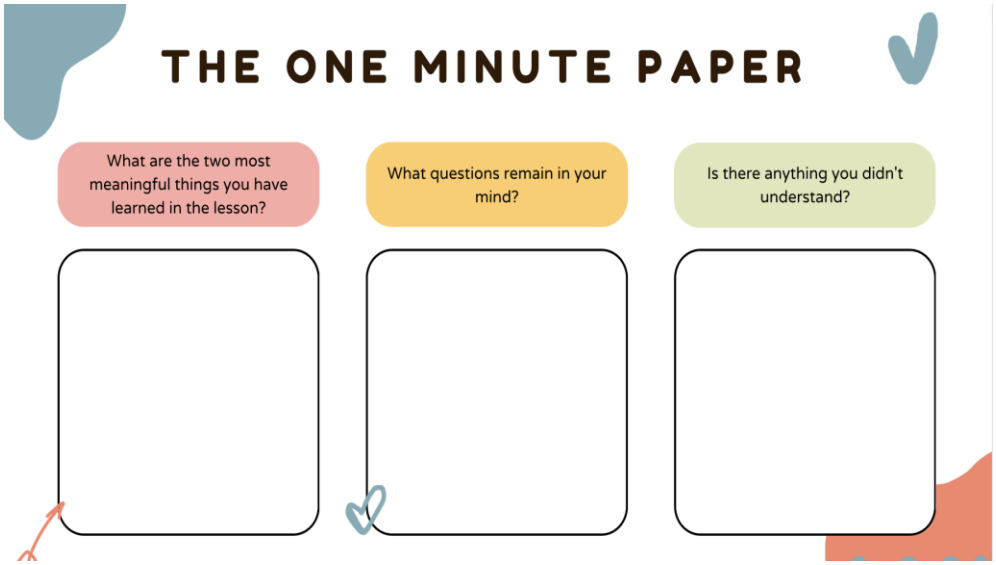
The students collaboratively perform the Microscope Scavenger Hunt. The groups will check as many boxes that they can depending on the number of specimens that they have successfully viewed.

The specimen will be illustrated and the magnification will also be identified.

If microscopes are not available, a Scavenger Hunt version using the virtual microscope may be done.

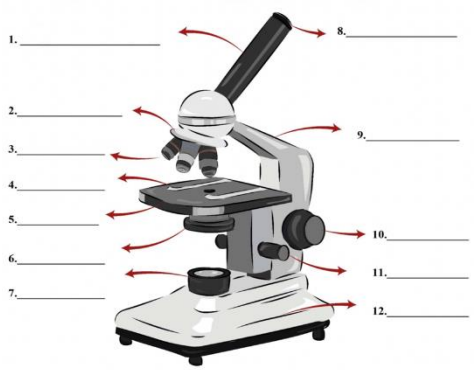
	Create the Storyline: Using the graphic organizer, summarize the steps on how to properly handle the compound microscope. *Teacher may choose any graphic organizer.*  **How to handle a compound microscope** 1. Turn the revolving nosepiece so that the lowest power objective lens (eg. 4x) is clicked into position. 2. Place the microscope slide on the stage and fasten it with the stage clips. 3. Look at the objective lens and the stage from the side and turn the focus knob so the stage moves upward. Move it up as far as it will go without letting the objective touch the coverslip. 4. Look through the eyepiece and move the focus knob until the image comes into focus. 5. Adjust the condenser and light intensity for the greatest amount of light. 6. Move the microscope slide around until the sample is in the center of the field of view. 7. Use the focus knob to place the sample into focus and readjust the condenser and light intensity for the clearest image. 8. When you have a clear image of your sample with the lowest power objective, you can change to the next objective lenses. You might need to readjust the sample into focus and/or readjust the condenser and light intensity. Do not let the objective lens touch the slide! 9. When finished, lower the stage, click the low power lens into position and remove the slide.	After the students will manipulate the microscope, they will create the storyline on how to handle and store the compound microscope. This activity can be done collaboratively.

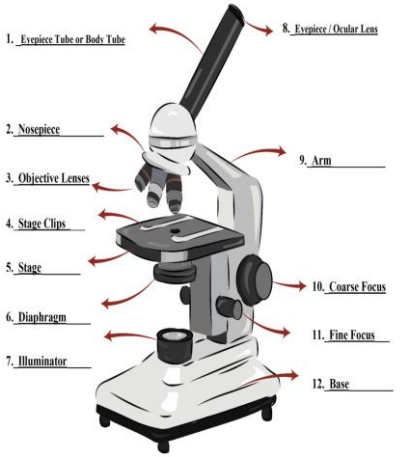
D. Making Generalizations	**Learners' Takeaways** **KWL Chart**: Using the graphic organizer, the students will answer the L column or what they have learned about the given term.  **Reflection on Learning** **One Minute Paper:** Using the graphic organizer, reflect on your learning by creating a one-minute paper by answering the questions.	Towards the end of the lesson, the students will revisit the KWL Chart to map the conceptual change. It allows the learners to identify their takeaways of the lesson. The students, at this point, will reflect on their learning by answering the one-minute paper. This will allow them to map what are the meaningful things they have learned, the questions they still have, and anything they did not understand.



IV. EVALUATING LEARNING: FORMATIVE ASSESSMENT AND TEACHER'S REFLECTION		NOTES TO TEACHERS
A. Evaluating Learning	**1. Formative Assessment** A. Matching Type. Match the terms in Column B with the description in Column A.	Teachers may encourage learners to have a quiz notebook to monitor learners' academic progress. The quiz notebook may also serve as homework notebook. ***Answer Key:*** 1. D 2. B 3. C 4. F 5. E

Column A	Column B
1. The process which a microscope enlarges an image. It is calculated by multiplying the magnification of the objective lens by the magnification of the eyepiece. 2. The lens at the top of the microscope that you look through to observe the specimen. It further magnifies the image produced by the objective lens. 3. The light source used to illuminate the specimen. It can be from a built-in light source, a mirror, or an external light. 4. The platform on which the specimen is placed for observation. 5. The primary lens in a compound microscope that is closest to the specimen and responsible for magnifying the image.	A. Base B. Eyepiece C. Illuminator D. Magnification E. Objective Lens F. Stage

<table>
<tr>
<td></td>
<td colspan="3">
B. Labelling. Identify the parts of the microscope by writing your answer on the blank provided.


Homework (Optional)
Discussion. Read and answer the guide questions that follow.
The discovery of the microscope led to the discovery of many things in biology.
What are the various applications of microscopes in daily life? Provide specific examples to illustrate the impact of microscopy on everyday life and future developments.
</td>
<td>
Answer Key:


</td>
</tr>
<tr>
<td rowspan="5">B. Teacher's Remarks</td>
<td>Note observations on any of the following areas:</td>
<td>Effective Practices</td>
<td>Problems Encountered</td>
<td rowspan="5">Teachers are encouraged to record relevant observations or any critical teaching events that influence on the attainment of the lesson objectives. Use or modify the provided template in recording the notable instructional areas or concerns.

In addition, notes here can also be on tasks that will be continued the next day or additional activities needed.</td>
</tr>
<tr>
<td>strategies explored</td>
<td></td>
<td></td>
</tr>
<tr>
<td>materials used</td>
<td></td>
<td></td>
</tr>
<tr>
<td>learner engagement/ interaction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td></td>
<td></td>
</tr>
</table>

C. Teacher's Reflection	*Reflection guide or prompt can be on:* ▪ *<u>principles behind the teaching</u>* *What principles and beliefs informed my lesson?* *Why did I teach the lesson the way I did?* ▪ *<u>students</u>* *What roles did my students play in my lesson?* *What did my students learn? How did they learn?* ▪ *<u>ways forward</u>* *What could I have done differently?* *What can I explore in the next lesson?*	*Entries on this section are teacher's reflections about the implementation of the whole lesson, which will serve as inputs for the LAC sessions. Use or modify the provided guide questions in eliciting teacher's insights.*