## Required Text:
The Usborne Complete Book of the Microscope – Kirsteen Rodgers

## Supplementary Text:
The Microscope Book – Shar Levine & Leslie Johnstone

<table>
<thead>
<tr>
<th>Day</th>
<th>Goals &amp; Objectives</th>
<th>Activities</th>
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<tr>
<td>Day 1</td>
<td></td>
<td>• Introductions/Ice breaker&lt;br&gt;• Mystery Pictures&lt;br&gt;• Class Rules&lt;br&gt;• Course Syllabus&lt;br&gt;• Lab Safety and Honor Code&lt;br&gt;• What are the Characteristics of Living Things? (Sewer Lice Demonstration)&lt;br&gt;• Pre-assessment&lt;br&gt;• Parts of a Microscope&lt;br&gt;• Matching Game with Microscope Parts Function&lt;br&gt;• Drawing microscopic images with accuracy&lt;br&gt;• Daily Reflection&lt;br&gt;Homework: Sequential Paragraph – Using the Internet to Using a Microscope</td>
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<td>Monday</td>
<td>• Group Introductions&lt;br&gt;• Safety &amp; Contract&lt;br&gt;• Students will come up with the Class Rules/Norms&lt;br&gt;• Setup Lab Notebook&lt;br&gt;• Characteristics of Life&lt;br&gt;• Pre-Assessment&lt;br&gt;• Parts of a Microscope – Day 1&lt;br&gt;• Science Skills: Drawing microscopic images</td>
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<td>Day 2</td>
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<td>• Mystery Picture&lt;br&gt;• Power of 10 video (9 minutes)&lt;br&gt;• Types of microscopes (Part 1) Pages 80-84 and identify the key steps in history of microscopy&lt;br&gt;• History of the Microscope video(3:07)&lt;br&gt;• History of Microscopy Notes&lt;br&gt;• Making a water scope (Page 81)&lt;br&gt;• Microscope Parts Pictionary&lt;br&gt;• Cell theory Notes&lt;br&gt;• Cell Theory Exploration Lab&lt;br&gt;• Daily Reflection&lt;br&gt;Homework: Microscope crossword</td>
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<td>Tuesday</td>
<td>• Types of microscopes and history of microscopy&lt;br&gt;• Make a water scope&lt;br&gt;• Learn the parts of a microscope – Day 2&lt;br&gt;• Determine what makes up cell theory and which scientist was part of creating the theory</td>
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<td>Day 3</td>
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<td>• Mystery Picture #3&lt;br&gt;• Yesterday’s daily reflection (I forgot yesterday!)&lt;br&gt;• Simon Says&lt;br&gt;• Practice parts of a microscope and how to use a microscope for a quiz&lt;br&gt;• Proper use of a Microscope (with Monday’s Homework)&lt;br&gt;• What happens when…&lt;br&gt;• Determining Magnification &amp; Resolution&lt;br&gt;• Depth of field</td>
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<td>Wednesday</td>
<td>• Familiar with microscope parts&lt;br&gt;• Become familiar with focusing a microscope&lt;br&gt;• Understand how to calculate magnification&lt;br&gt;• General use and handling of a microscope&lt;br&gt;• Make a wet mount&lt;br&gt;• Drawing microscopic images to scale&lt;br&gt;• Use the microscope to make observations and record specific details in student’s lab notebook like the color, shape and features of</td>
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<td>Day 4 Thursday</td>
<td>Day 5 Friday</td>
<td>Day 6 Monday</td>
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| ● Describe the different types of microscopes  
● What is a cell? What are the different kinds of cells?  
● Make a permanent mount  
● Develop microtechnique skills, such as dry and wet mounts, permanent mount, dark light and polarizing microscopy  
● Develop techniques for finding algae in a wet mount | ● Determine what a cell is  
● Develop microtechnique skills, such as dry and wet mounts, permanent mount, dark light and polarizing microscopy  
● What are the types of Eukaryotic Cells?  
● Intro to Organelles  
● Determine the parts and function of a plant cell  
● Prepare a lab for *Rhizopus* growth and microscopy | ● Determine the parts and function of animal cells  
● Determine the parts and function of a plant cell  
● Determine the differences between plant and animal cells  
● Explain what happens to plant cells when placed in salt water  
● Understand the functions of staining |

- The letter “E” and other wet mounts  
- Reflection  

Homework: Types of microscopes  

| Homework discussion  
| Types of Microscopes: How can you tell what microscope is used? and homework discussion  
| Cells – video (14 min.)  
| Types of cells notes: Eukaryotic and Prokaryotic  
| Dark light and Polarization Viewing  
| Students will read scenarios based on the use of the microscopes and analyze their observations (Wet mount Explorations 2 or 3; Smear 4, Polarization 1 and 6, Permanent mount either 1 or 7)  
| Reflection  

Homework: Prokaryotic and Eukaryotic Flash Card Creation  

| Mystery Picture  
| What are eukaryotic cells and Intro to Organelles (Plant vs. Animal) Notes  
| Plant Vs. Animal Exploration Lab  
| 3D Cell Model Project - Plant  
| Finish microscope techniques worksheets  
| Set up bread mold project  
| Reflection  

Homework: Plant and animal video with questions  

| Mystery Picture  
| Observation of plant cells including Elodea (Book pages 40-41), prepared plant slides, and wet mount of Elodea with fresh water vs. salt water  
| Comparing living and dead cells (onion, elodea and cork cell slide creation)  
| Observe Prepared Animal Slides  
| Label and color animal cell diagram  
| Inside a body cell (Book pages 26-29)  
| Cheek cell lab with staining  
| Reflection  

Homework:
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|        | ● Determine the parts and function of animal cells  
|        | ● Determine how cell membranes allow molecules in and out of the cell  
|        | ● Characteristics of Protists  |
|        | ● Mystery Slide  
|        | ● 3D Cell model project - Animal  
|        | ● Cell Membrane Lab  
|        | ● SCOP students will show the “Be a Scientist” students how to use a microscope at 10:30  
|        | ● Discuss characteristics of Protists  
|        | ● Protists Video (23 minutes)  
|        | ● Water plants (algae) from Book pages 46-47  
|        | ● Examine the many different protists we have in the classroom using the dark field vs. normal light  
|        | ● Reflection  |

**Homework:**

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<th>Wednesday</th>
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|        | ● Describe the structure of DNA, including nucleotides and base pairs  
|        | ● Extract DNA from plant materials  
|        | ● “Examine” DNA under the microscope  
|        | ● Compare DNA with RNA  |
|        | ● Mystery slide  
|        | ● Learn about the nucleus and DNA – what is it? Why is it so important? Who discovered the structure of DNA? Watson, Crick and Franklin: Notes  
|        | ● Create a 3D DNA Molecule  
|        | ● DNA extraction from strawberries and bananas and compare to virtual lab  
|        | ● Prepare a wet mount of DNA and observe under the microscope  
|        | ● Compare and contrast DNA with RNA  
|        | ● Reflection  |

**Homework:**

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<th>Thursday</th>
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|        | ● Describe how cells reproduce, including mitosis, binary fission, and vegetative propagation  
|        | ● Determine how plants get energy  
|        | ● Explain the components of photosynthesis  
|        | ● Compare cellular respiration to photosynthesis  
|        | ● Determine which cells photosynthesize and which use cellular respiration.  |
|        | ● Mystery Slide  
|        | ● Notes on reproduction  
|        | ● Mitosis Foldable  
|        | ● Stomata plant peel to view stomata  
|        | ● Photosynthesis/Cellular Respiration Cards  
|        | ● Cellular Respiration and Photosynthesis foldable  
|        | ● Reflection  |

**Homework:**

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<th>Friday</th>
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|        | ● Describe the characteristics of prokaryotes  
|        | ● Explain the importance of prokaryotes in the environment  
|        | ● Calculate and graph the exponential growth of data  
|        | ● Make a wet mount of mold and record observations  
|        | ● Examine prepared slides of bacteria as a comparison to the mold  |
|        | ● Mystery Slide  
|        | ● Complete BTB Lab Write-up  
|        | ● Fill out KWL chart about bacteria  
|        | ● Bacteria video (21 min)  
|        | ● Coloring the parts of a bacteria and labeling  
|        | ● Active cultures of yeast, yogurt and kim chee  
|        | ● Examination of prepared slides  
<p>|        | ● IROB Soccer match |</p>
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<tr>
<th>Day 11 Monday</th>
<th>Day 12 Tuesday</th>
<th>Day 13 Wednesday</th>
<th>Day 14 Thursday</th>
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<td>● Participate as spectators for IROB to further engage students for CTY classes they may be able to take in the future</td>
<td>● Describe how fungus reproduces</td>
<td>● Students will make their own hair samples</td>
<td>● Examine various insects and the diversity</td>
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<td>● Homework:</td>
<td>● Describe the structures of fungus under the microscope</td>
<td>● Students will examine how hair &amp; fibers are used in a CSI</td>
<td>● Determine the size of objects under the microscope</td>
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<td>● Observe prepared slides of fungus</td>
<td>● Make slides of bread mold</td>
<td>● Exploring crystals and their characteristics</td>
<td>● Use the knowledge of CSI to</td>
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<td>● Create a book to showcase all the drawings and work students did in class.</td>
<td>● Describe</td>
<td>● Using polarizing film to compare and contrast</td>
<td>●</td>
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<td>● Create a book to showcase all the drawings and work students did in class.</td>
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| Day 15 Friday | Reflections – Students, Teachers and PAs | Final Mystery Slide  
Post Assessment  
CSI scenario  
Microscope Scavenger Hunt  
Reflection and Warm Fuzzies to Class – Cards to Each Other  
Closing Activities |
|----------------|----------------------------------------|---------------------------------------------------------------|
| Homework:      | Look at insects in the hand lens boxes, and under the microscope  
Measure the size of insect parts  
Present our Microscope Books to Class  
Review for Final Assessment  
Reflection |
| determine a suspect in a “crime”  
Create a book to showcase all the drawings and work students did in class. | |