

Microscope Skills Investigation

Biology / Lab Skills · Grades 9–12

Practice microscope setup, focusing, specimen orientation, and readiness before working with real laboratory equipment.

NGSS: Science & Engineering Practice — Planning and Carrying Out Investigations. Use laboratory tools carefully, follow multistep procedures, and collect reliable observations.

Name: _____ Class: _____ Date: _____

Before You Begin

1. Why should a microscope always begin on the lowest-power objective when you first locate a specimen?

2. Predict what will happen to the apparent position of the printed letter if you move the stage to the right.

Part A · Identify the Instrument

Use Explore and the labeled reference diagram. Identify each part and write its main job.

Microscope part	Main function
Eyepiece / ocular	
Objective lenses	
Stage / slide holder	
Coarse-focus control	
Fine-focus control	
Illuminator	

Part B · Letter “e” Investigation

Open Operate. Load the Letter “e” slide, turn on the light, begin at 4×, center and focus the specimen, then use the stage controls and higher objectives.

Observation	What you see
Orientation of the letter in the eyepiece	
Image response when stage moves left/right	
Image response when stage moves forward/back	
Field of view as objective power increases	

3. Explain why the image appears to move opposite the direction that the stage is moved.

Part C · Mystery Specimen / Readiness Check

Open Readiness Check and press Begin Check. The simulator randomly loads either an onion epidermis or cheek epithelial-cell slide. Record which specimen you receive, then obtain a clear image by using the 4×, 10×, and 40× objectives in a safe sequence.

Mystery specimen	Low power (4×)	Medium power (10×)	High power (40×)
Onion or cheek: _____			

4. What changes as objective power increases? Include both visible detail and field of view.

Readiness & Safety

5. Write a safe, efficient sequence for focusing a real microscope from the moment a slide is placed on the stage.

6. Why is the coarse-focus control appropriate at low power but unsafe or inappropriate at 40×?

7. What is one mistake that could damage a slide, objective lens, or specimen? How would you prevent it?

Exit Ticket

Complete the sentence: Reliable microscope observations depend on controlling _____ and _____.
