

# Advanced Microscope Techniques

## Summary

In this lab students will practice using the diaphragm to regulate the light entering the microscope, focus on objects at different depths of field, determine a microscope's field size under both high and low power and estimate the size of specimens viewed under the compound microscope by comparing the specimen to a known field size.

## Main Core Tie

Science - Biology

[Standard 2 Objective 3](#)

## Time Frame

2 class periods of 60 minutes each

## Group Size

Small Groups

## Materials

- [student sheet](#)  
(attached)
- microscope slides
- medicine droppers
- tap water
- coverslips
- compound microscopes
- prepared slides of cells
- forceps
- dissecting needles
- cotton balls
- thread (one dark and one light color)
- scissors
- transparent plastic centimeter ruler

## Background for Teachers

### Safety Issues:

Students should use caution when handling the microscopes. They should also be careful handling the glass slides and coverslips.

## Instructional Procedures

Obtain needed supplies.

You may want to cut the plastic centimeter ruler into small pieces around 3 cm long for students to use, but this is not necessary if you have enough rulers for all students

Estimate the size of the organisms or part of organisms in the prepared slides that you choose for your students to use in this lab.

## Assessment Plan

## Suggested Scoring Guide:

Letters A-L .....	1 point each (12 points)
Chart.....	2 points each (8 points)
Analysis questions.....	2 points each (12 points)
Conclusions.....	6 points
Total.....	38 points

## Answers to Questions:

- a. *Answers will vary, it should be somewhere in the middle*
- b. *Answers will vary, most likely it is the same possibly more light was needed*
- c. *Yes*
- d. *No*
- e. *One thread comes into focus as the other goes out of focus*
- f. *Answers will vary, usually around 1.5 mm*
- g. *Answers will vary, usually around 1500 m*
- h. *Answers will vary, usually 400X*
- i. *Answers will vary, usually 100X*
- j. *Answer will be the same as letter (g)*
- k. *375 m*
- l. *500 m*

Answers in the chart will vary depending on the slides you choose for your students. You may try giving them slides from different kingdoms.

1. *It does not need to be adjusted but if so more light is usually needed.*
2. *You may not be seeing everything that is present in the slide at once. You should therefore use your fine focus to make sure you are seeing everything that you need to be.*
3. *Less*
4. *300 micrometers*
5. *200 micrometers*
6. *The microscope has allowed us to see different types of cells and what they are composed of. It has allowed us to look at cells from all different types of organisms and see the similarities and differences.*

Conclusions: Answers will vary.

## Bibliography

Lesson Design by Jordan School District Teachers and Staff.

## Authors

[Utah LessonPlans](#)