

**NOEO
SCIENCE
BIOLOGY 2
LAB MANUAL**

**NOEO
SCIENCE
BIOLOGY 2
LAB MANUAL**

Created by Dr. Randy Pritchard

noeo science
MOSCOW, IDAHO

Noeo Science Packages

GRADES 1-3 /

AGES 5-8

Biology 1

Physics 1

Chemistry 1

GRADES 4-6 /

AGES 9-12

Biology 2

Physics 2

Chemistry 2

GRADES 7-8 /

AGES 12-15

Physics 3

Chemistry 3

Published by Noeo Science
PO Box 8729, Moscow, Idaho 83843
800-488-2034 | www.noeoscience.com
Email us at service@noeoscience.com

Randy Pritchard, *Noeo Science Biology 2: Lab Manual, 3rd Edition*
Copyright ©2022 by Noeo Science
First edition 2021. Second edition 2022.

Cover design & illustration by Forrest Dickison
Interior design by Valerie Anne Bost
Printed in the United States of America. All rights reserved.

Scripture taken from the NEW AMERICAN STANDARD BIBLE®, Copyright © 1960, 1962, 1963, 1968, 1971, 1972, 1973, 1975, 1977, 1995 by The Lockman Foundation. Used by permission.

All rights reserved. Unless otherwise noted, no part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form by any means, electronic, mechanical, photocopy, recording, or otherwise, without prior permission of the author, except as provided by USA copyright law.

unit 1:

THE MICROSCOPIC WORLD

Week 1: The Microscope	3
Week 2: Using Your Microscope	15
Week 3: Microscopy and Cells	23
Week 4: Classification	31



Week 1: The Microscope

Day 1 Worksheet

SCHEDULE

	DAY 1	DAY 2	DAY 3	DAY 4
<i>The World of the Microscope</i>	Read pp. 4, 10-11	Read pp. 12-13	pp. 14-15	p. 16
<i>Experiment Guide</i>	Make a simple Microscope	Hairs	Making a Temporary Mount	

OVERVIEW

Let's begin with a review of the definition of science: When we say "science," we mean two different things. First, science refers to the process by which people observe, question, and test the natural world. This is sometimes called the scientific method. Noeo provides regular experiments to help develop this side of science. However, science isn't all experimentation. Second, "science" also refers to the body of knowledge that other people (scientists) have discovered by using the scientific process. That's why some weeks of Noeo will have you reading great books about what others have discovered.

One more note before you start on Unit 1: Biology is the scientific process applied to the study of life itself, from the smallest living things to the biggest. You'll be observing and reading about as many living creatures as possible this year in Biology 2. This week and next, you'll need to get very familiar with one of the coolest tools for doing that this year: the microscope. Be patient, because it takes practice and skill to be able to observe specimens with a microscope. That's why you'll have a few more instructions than usual as you get comfortable.

READING QUESTIONS

1. What did Antonie van Leeuwenhoek make?

2. What did Robert Hooke draw?

3. What were electron microscopes able to do?

EXPERIMENT: MAKE A SIMPLE MICROSCOPE

1. What were you able to see through your simple microscope?
Draw it here.

2. Whose simple microscope were you imitating in this experiment?



Week 1: The Microscope

Day 2 Worksheet

READING QUESTIONS

1. What are the differences in appearance between human hair, sheep hair, and dog hair (p. 12)?

2. What are bottom and top lighting?

3. What are cavity and ring slides?

4. What are slide cover slips?

5. What did the hair from the adult's head look like?

6. What did the hair from the child's head look like?

7. What did the hair from your pet look like?

8. What did the feather from a bird look like?

EXPERIMENT QUESTIONS: HAIRS

1. What were you able to see through your simple microscope?
Draw it here.



Week 1: The Microscope

Day 3 Worksheet

READING QUESTIONS

1. What is a nucleus?

2. What is the cytoplasm?

3. What are granules of glycogen?

4. What is the cell membrane?

5. What are chloroplasts?

6. Sketch the magnified onion.



Week 1: The Microscope

Day 4 Worksheet

READING QUESTIONS

1. What are bacteria?

2. Where do they live?

3. What are cocci and bacilli?

4. Did you see anything new when you looked at the hair cell again?



Week 2: Using Your Microscope

Day 1 Worksheet

SCHEDULE

	DAY 1	DAY 2	DAY 3	DAY 4
<i>The World of the Microscope</i>	p. 17	pp. 20–21	pp. 22–23	
<i>Experiment Guide</i>	Band-Aid	Paper		Sugar Crystals & Rocks

OVERVIEW

It's very important that you get comfortable with your microscope. You'll get more practice observing things under the microscope as you continue to learn about the microscopic world. Specifically, you'll get more practice using your microscope at different levels of magnification.

READING QUESTIONS

1. What are viruses?

2. Do they exist on their own?

3. Why were they discovered long after the discovery of bacteria?

EXPERIMENT QUESTIONS

1. What were you able to see through your microscope? Draw it here.



Week 2: Using Your Microscope

Day 2 Worksheet

EXPERIMENT QUESTIONS: MOMENTUM

1. What are plankton?

2. What are algae?

3. What are hydroids?

4. What are bryozoans?

EXPERIMENT QUESTIONS

1. What were you able to see through your microscope? Draw it here.



Week 2: Using Your Microscope

Day 3 Worksheet

EXPERIMENT QUESTIONS: MOVING PENNIES

1. What are flagellates?

2. What are diatoms?

3. What are ciliates?

4. What are rotifers?
