Key

* Indicates main chapter topic, labs, and activities
* Indicates video
* Indicates a subtopic in the chapter.

Unit 1: Basic Micro-Biology

1. Chapter 1: Introduction
	* Topic: What Is Microbiology?
		+ Life in a Drop of Pond Water
	* Your Microbiome
	* Microbiology and the Definition of Life
	* Does Science Need a New Definition for “Life”?
		+ Defining Life
	* Lab: If Viruses Were the Size of a Pepper Flake… How Micro Are Microbes? Modeling Lab
		+ Lab 1: Purposes, Practices, and Techniques
	* Microscope Lab: Microbes in Pond Water
		+ Microscope Lab: Microbes in Pond Water
2. Chapter 2: Life: It’s Genetic
* Topic: Basic Genetics
	+ We Are All Related
	+ Self-Replication + Reproduction Leads to Sharing
	+ The Code Makes the Organism
	+ Proteins Do the Work
	+ Everybody Makes Mistakes Sometimes
	+ Everybody Makes Mistakes
	+ Life: It’s Genetic
* Lab: The Code that Makes Us: DNA and RNA Modeling
	+ Lab 2: Purpose, Practices, and Techniques
1. Chapter 3: You Are a Warrior, Especially When You’re Sick
	* Topic: Immune System
	* Your Immune System Keeps You Healthy
		+ Cilia Mucus Traps
	* Your Blood Is a Part of Your Immune System
		+ Warrior Scouts Are in Your Blood
		+ The Warrior’s Playbook: The Cells of Your Immune System
* Lab: How Dirty Could They Really Be?
	+ Lab 3: Purpose, Practices, and Techniques

Unit 2: Bacteria and Archaea: We Are the Prokaryotes!

1. Chapter 4: Bacteria and Archaea: Small but Mighty
	* Topic: Basic Biology of the Prokaryotic Cell
	* Archaea Are Everywhere, Too
	* Bacteria and Archaea Have Prokaryotic Cells
		+ Plants & Bacteria Are BFFs
	* Species: A New Definition
	* Species of Prokaryotes
		+ Types of Bacteria
	* Lab: Building a Prokaryote Modeling Lab

*Version 1: A Plaster of Paris Model*

*Version 2: A Pizza Model*

* + - Lab 4: Purpose, Practices, and Techniques
	+ Writing Activity: Making a Microbial Mutant
* Mutating Microbes Activity
1. Chapter 5: Beneficial and Harmful Bacteria
	* Topic: The Good and the Bad of Bacteria
		+ Your Microbiome
	* Your Health and the Good and Bad of Bacteria
	* Toxins: How Bacteria Make You Sick
	* How Your Immune System Fights Bacteria
		+ Antibiotic Resistance
	* Lab: Let’s Grow and Let’s Kill Microbes
		+ Lab 5: Purpose, Practices, and Techniques
	* Microscope Lab: A Close Look at the Good Guys: Bacteria Under the Scope
* Microscope Lab: Bacteria Under the Scope

Unit 3: Viruses

1. Chapter 6: Basic Virology
* Topic: Virology: The Basics
	+ - Bacteriophages
	+ If Viruses Are Alive, What Kind of Organism Are They?
	+ Types of Viruses
		- The Geometry of Viruses
	+ The Lifecycle of Viruses: The Lytic Cycle
	+ Lab: A Model Virus: Make a Bacteriophage
		- Lab 6: Purpose, Practices, and Techniques
1. Chapter 7: Virology and the Immune System
	* Topic: Virology: Infection, Immunity, and You
	* Matching Proteins
	* When Viruses Mutate: Variants
		+ Reassortment
	* Vaccines Teach Your Immune System
		+ Vaccines: School for Your Immune System
* Lab: The Spread of Infection – Exponential Growth and the Rate of Infection
	+ Lab 7: Purpose, Practices, and Techniques

Unit 4: Microbes Make History

1. Chapter 8: Synthetic Biology
	* Topic: Harnessing the Power of Microbes
		+ Engineering Bacteria to Identify Parasites
	* Synthetic Biology
	* The Tools of Synthetic Biology
		+ A Retrovirus that Shaped Evolution
	* How Synthetic Biologists Use these Tools
		+ Using the Tools of Synthetic Biology
		+ Curing Sickle Cell Disease
	* Lab: A Retrovirus Modeling Lab
		+ Lab 8: Purpose, Practices, and Techniques
* Writing Activity: A Virus of My Very Own
* A Virus of My Very Own
1. Chapter 9: Pathogens Make History
	* Topic: Pandemics
	* But, Why Did Mammals Dominate the Land Instead of Birds or Reptiles?
	* The History of the Science of People and Pathogens
		+ The Spread of the Coronavirus 2019 Pandemic
	* The Top Two Pathogens to Make History
		+ Keeping Emerging Diseases from Becoming Pandemics: mRNA Vaccines

*The Deadliest Pathogen in History: The Bacteria Yersinia Pestis*

*The Second Deadliest Pathogen in History: The Variola Virus*

* + Modeling Lab: Simple Plague Mask Tutorial
		- Lab 9: Make a Plague Mask
* Writing Activity: My Pandemic Makes History
* My Pandemic Makes History

Unit 5: Eukaryotic Microbes

1. Chapter 10: Microscopic Fungi
	* Topic: Microscopic Fungi
		+ Dung Cannon Fungus
	* Fungi Have Eukaryotic Cells
	* Getting Food
	* The Two Types of Microbial Fungi

*Yeasts*

*Molds*

* + Fungi Lifecycle
		- The Mycorrhizal Network: How Plants Communicate
	+ The Mycobiome
	+ Bad Fungi and Zombie Ants
	+ Lab: Baking with Microbes
		- Lab 10: Purpose, Practices, and Techniques
	+ Microscope Lab: Microbial Fungi Under the Scope
* Microbial Fungi Under the Scope
1. Chapter 11: Microbial Algae
	* Topic: Algae: Mighty, Mighty Microbe!
		+ Monitoring Photosynthesis
	* What Are These Mighty Microbes?
		+ Releasing Oxygen
	* Photosynthesis: A Recipe
		+ Algae, Biofuel, & Synthetic Biology
	* Molecular Modeling Basics
		+ Molecular Modeling Basics with Photosynthesis
	* Good Algae Gone Bad: Algal Blooms
	* Lab: Algae, Carbon Dioxide, and Global Warming
		+ Lab 11: Purpose, Practices, Techniques
2. Chapter 12: Protozoans
	* Topic: Protozoa: We Are Not Animals
	* Traits of Protozoa
	* Types of Protozoa
		+ Vorticella and Rotifers: A Microscopic View
	* There Are Good Protozoa and Bad Ones, Too
	* Phagocytosis: The Hug of Death
		+ Amoeba Activity
	* Parasitic Protozoa that Affect Human Health
	* Two Parasitic Pathogenic Protozoa

*Giardia*

*Plasmodium*

* Lab: Amoeba Cake Eats Algae Cupcake
	+ - Lab 12: Tips for Making the Cake