Odysseyware®

CURRICULUM OVERVIEW

Scientific Discovery and Development

Career and Technical Education Series

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Scientific Discovery and Development Course Overview

This course focuses Laboratory Careers, in which students learn about more than two dozen jobs in laboratory science. Each lesson that covers careers describes, sometimes in great detail, what specific professionals do on the job. For each career students learn what is necessary in the areas of education and credentialing, and also will be able to have a good idea of the job outlook and salaries of these various professions. Students also learn quite a bit of science related to many of those careers as well as about the scientists and major breakthroughs that have brought us where we are today in laboratory science.

- **Introduction to Laboratory Science:** Students will explore the history of clinical laboratory science, learning how clinical laboratories evolved and became professionalized and how scientific discoveries and breakthroughs fueled the development of the laboratory while the sub-disciplines in biology were also advancing. The science covered in the first unit includes immunology, the circulatory system, and the blood-bank system.

- **Clinical Laboratory Careers:** Students will learn about the circulatory system and about microbiology and the subfields within it.

- **Tissues and Cells:** Students will explore cells and tissues, cell division and basic genetics.

- **Research and Development:** Students will learn a brief history of the philosophy of science, along with an explication of the scientific method. The unit goes on to teach the difference between basic and applied research. This unit also covers three major areas in bioresearch: biotechnology, nanotechnology, and pharmaceutical research and development.

- **Research and Development, Part II:** Students will explore research in the social science that is something of a hybrid, since the topics cross over into science. Emphasis is put on the interdisciplinary nature of this type of research. The last few lessons in the unit raise the controversial issues of embryonic stem-cell research and the problems raised by outsourcing clinical research. The final lesson gives students a chance to catch their breath and do some exercises that can help them find a career path they are interested in.

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Unit 1: Introduction to Laboratory Science

Assignments

1. Course Overview
2. History of Clinical Laboratory Science
3. Project: Back in the Day
4. Clinical Laboratory Science after 1945
5. Project: The State of My State's Clinical Laboratories
6. Clinical Laboratory Scientist
7. Quiz 1: History and Clinical Laboratories
8. Clinical Laboratory Technologist
9. Clinical Laboratory Technician
10. Project: Television Dramas and Medical Laboratory Technology
11. Blood Bank Technology Specialist
12. Project: Creating a Clinical Laboratory Sciences Career Guide
13. Quiz 2: People and Milestones
14. Special Project*
15. Test
16. Course Project - Part 1: Gregor Mendel's Contributions to the Study of Genetics*
17. Glossary and Credits

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Unit 2: Clinical Laboratory Careers

Assignments

1. Phlebotomist
2. Project: Order of the Draw
3. Hematology
4. Research Immunology
5. Project: Talking Immunity
6. Quiz 1: Contributions to Science
7. Microbiologist
8. Project: Diagnosis and Treatment of Infection
9. Clinical Microbiology
10. Public Health Microbiologist
11. Project: Comparing Two Categories of Pathogens
12. Quiz 2: Infectious Agents
13. Special Project*
14. Test
15. Course Project - Part 2: History of the Virus*
16. Glossary and Credits

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Unit 3: Tissues and Cells

Assignments

1. Structural Anatomy of Tissues
2. Project: Developing a Lab Manual
3. Histotechnologist and Histotechnicians
4. Pathologist Assistant
5. Project: Prepping Specimens in the Histology Lab
6. Quiz 1: Lab Positions
7. Cytotechnologist
8. Genetics and the Genome
9. Project: Recent Adaptations in Humans
10. Cytogenetic Tech & Diagnostic Molecular Scientist
11. Project: Is Left-handedness Genetic?
12. Quiz 2: Cellular Construction
13. Special Project*
14. Test
15. Course Project - Part 3: Vaccine Development as Early Genetic Engineering*
16. Glossary and Credits

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Unit 4: Research and Development

Assignments

1. Research
2. Project: Investigating a Problem by Using the Scientific Method
3. Types of Research
4. Project: Why Should I Get My Child Vaccinated?
5. Medical Research
6. Quiz 1: Medical Research and Its History
7. Biotech: Genetic Engineering, Gene Therapy
8. Project: Virtual Lab: Simulating a PCR Test
9. Biotech: Nanotechnology
10. Pharma R&D
11. Project: Virtual Lab: Immunology
12. Quiz 2: Public Health and Scientific Discoveries
13. Special Project*
14. Test
15. Course Project - Part 4: The Discovery of the Structure of DNA*
16. Glossary and Credits

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Unit 5: Research and Development, Part II

Assignments

1. Economics
2. Project: Reforming America's Health Care System
3. Medical Sociology and Health Psychology
4. Medical Anthropology
5. Project: Create a Survey
6. Quiz 1: Anthropology
7. Stem-Cell Research
8. Project: Stem-Cell Point/Counterpoint
9. Double Standards in Research
10. Project: Is a Double Standard of Care Ethically Justifiable?
11. Choosing a Career
12. Project: What's the Right Career for You?
13. Quiz 2: Ethics and the Big Picture of Research
14. Special Project*
15. Test
16. Course Project - Part 5: Genetic Diversity in Human Populations*
17. Glossary and Credits

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Unit 6: Course Review and Exam	
Assignments	
1. Course Project - Part 6: A Scientific Breakthrough*	2. Review 3. Exam

(*) Indicates alternative assignment

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