



2019-20

CALVERT HOMESCHOOL™ CURRICULUM CATALOG

Science 500



Table of Contents

SCIENCE 500 COURSE OVERVIEW.....	1
UNIT 1: CELLS.....	1
UNIT 2: PLANTS: LIFE CYCLES	2
UNIT 3: ANIMALS: LIFE CYCLES	2
UNIT 4: THE WEB OF LIFE	2
UNIT 5: TRANSFORMATION OF ENERGY	3
UNIT 6: PHYSICAL GEOLOGY.....	3
UNIT 7: RECORDS IN ROCK: FOSSILS	3
UNIT 8: RECORDS IN ROCK: GEOLOGY	4
UNIT 9: CYCLES IN NATURE	4
UNIT 10: LOOK AHEAD.....	4

Science 500 Course Overview

Science 500 is a basic elementary course intended to expose students to the designs and patterns in the physical universe. This course expands on the Science 300 and Science 400 courses, providing a broad survey of the major areas of science. Some of the areas covered in Science 500 include the study of cells, plants and animals, ecology, energy, geology, properties of matter, and the natural cycles of life.

The curriculum seeks to develop the students' ability to understand and participate in scientific inquiry. The units contain experiments and projects to capitalize on the students' natural curiosity. The students will explore, observe, and manipulate everyday objects and materials in their environment. Students at this level should begin to understand interrelationships between organisms, recognize patterns in ecosystems, and become aware of the cellular dimensions of living systems. Collectively, this should help students develop and build on their subject-matter knowledge base.

Upon completion of the course, students should be able to do the following:

- Use their main senses for observation of the world around them.
- Demonstrate an understanding of cells and their structure, both plant and animal.
- Differentiate between plants, animals, fungi, protozoa, and algae.
- Explain interactions between different life forms.
- Discuss various energy transformations.
- Demonstrate an understanding of fossil types and the formation of fossils.
- Describe the layers of the earth, landforms, and sources of change.
- Understand natural cycles.

Unit 1: Cells	
Assignments	
1. Course Overview	14. Project: Be Creative*
2. Living Units	15. Project: Explain Cells*
3. Experiment: The Microscope	16. Quiz 2: Structure and Function of Cells
4. Project: Robert Hooke*	17. Energy of Cells
5. General Cell Composition	18. Reproduction of Cells
6. Quiz 1: Living Units	19. Project: Anton Van Leeuwenhoek*
7. Structure and Function of Cells: Plants	20. Experiment: Stems*
8. Experiment: Beans*	21. Experiment: Cheek Cells*
9. Experiment: Onion Cells*	22. Quiz 3: Life and Growth of Cells
10. Structure and Function of Cells: Protozoa	23. Special Project*
11. Structure and Function of Cells: Animals	24. Test
12. Experiment: Pond Water*	25. Alternate Test*
13. Structure and Function of Cells: Tissue	26. Glossary and Credits

Unit 2: Plants: Life Cycles		
Assignments		
Science 500	1. Seed Bearing Plants: Life Stages	13. Fungi
	2. Seed Bearing Plants: Flowering Plants	14. Experiment: Mold*
	3. Experiment: Flower Dissection	15. Project: Uses of Fungi*
	4. Project: Draw Flowers*	16. Quiz 2: Spore Bearing Plants
	5. Experiment: Seed Dissection*	17. Algae
	6. Seed Bearing Plants: Cone Bearing Plants	18. One-celled Fungi: Yeasts
	7. Experiment: Cones*	19. Quiz 3: One-Celled Fungi
	8. Project: Seed Hunt*	20. Special Project*
	9. Quiz 1: Seed Bearing Plants	21. Test
	10. Spore Bearing Plants: Life Stages	22. Alternate Test*
	11. Spore Bearing Plants: Ferns	23. Glossary and Credits
	12. Project: Walking Fern*	

Unit 3: Animals: Life Cycles		
Assignments		
Science 500	1. Invertebrates: Life Cycles	12. Egg-Laying Vertebrates (Part 2)
	2. One-celled Organisms	13. Egg-Laying Vertebrates (Part 3)
	3. Project: Protozoa*	14. Experiment: Chicken Egg*
	4. Multicellular Invertebrates	15. Live-Bearing Vertebrates
	5. Experiment: Mealworm*	16. Project: Mammals*
	6. Project: Spiders*	17. Quiz 2: Vertebrates
	7. Project: Insect Study*	18. Special Project*
	8. Worms and Mollusks	19. Test
	9. Quiz 1: Invertebrates	20. Alternate Test*
	10. Vertebrates: Life Cycles	21. Glossary and Credits
	11. Egg-Laying Vertebrates (Part 1)	

Unit 4: The Web of Life		
Assignments		
Science 500	1. Balance of Nature: Life Needs	14. Project: Prairie Birds*
	2. Balance of Nature: Other Cycles	15. Prairie Food Chains
	3. Project: The Carbon Cycle*	16. Project: Prairie Food Chain*
	4. Mineral Cycle	17. Project: Special Environments*
	5. Project: Cycles*	18. Quiz 2: The Prairie Web of Life
	6. Balance of Nature: Dependence	19. Humans and the Web of Life (Part 1)
	7. Project: Food Chain*	20. Humans and the Web of Life (Part 2)
	8. Project: Build a Terrarium*	21. Quiz 3: Humans and the Web of Life
	9. Project: Terrarium Check*	22. Special Project*
	10. Quiz 1: The Balance of Nature	23. Test
	11. Prairie Web of Life (Part 1)	24. Alternate Test*
	12. Project: Prairie Land*	25. Glossary and Credits
	13. Prairie Web of Life (Part 2)	

Unit 5: Transformation Of Energy**Assignments**

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| Science 500 | <ol style="list-style-type: none"> 1. Energy 2. Forms of Energy 3. Work 4. Quiz 1: Energy and Work 5. Work From Energy 6. Sources of Heat Energy (Part 1) 7. Experiment: Paperclip* 8. Experiment: Heat Energy* 9. Sources of Heat Energy (Part 2) 10. Experiment: Chemical Energy* 11. Quiz 2: Work From Energy 12. Chemical Energy 13. Energy Change | <ol style="list-style-type: none"> 14. Quiz 3: Chemical Energy 15. Energy Concerns 16. Future Sources (Part 1) 17. Future Sources (Part 2) 18. Project: Energy* 19. Experiment: Sunlight* 20. Project: Survey* 21. Quiz 4: Present Energy Concerns 22. Special Project* 23. Test 24. Alternate Test* 25. Glossary and Credits |
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Unit 6: Physical Geology**Assignments**

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| Science 500 | <ol style="list-style-type: none"> 1. Earth Structures 2. Internal Structure 3. Igneous Structures 4. Project: Volcanoes* 5. Mountains 6. Quiz 1: Earth Structures 7. Earth Changes 8. Erosion and Sediment 9. Oceans | <ol style="list-style-type: none"> 10. Project: Weathering* 11. Quiz 2: Earth Changes 12. Plate Tectonics 13. Quiz 3: Plate Tectonics 14. Special Project* 15. Test 16. Alternate Test* 17. Glossary and Credits |
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Unit 7: Records in Rock: Fossils**Assignments**

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| Science 500 | <ol style="list-style-type: none"> 1. Fossil Formation 2. Experiment: Fossils 3. Experiment: Cast Fossil* 4. Fossil Formation: More Fossil Types 5. Fossil Formation: Location 6. Fossil Formation: Local Deposits 7. Project: Look for Fossils* 8. Quiz 1: Fossil Formation 9. Reading Fossils: Identification 10. Reading Fossils: Animal Fossils (Part 1) 11. Reading Fossils: Animal Fossils (Part 2) 12. Project: Plants and Animals* | <ol style="list-style-type: none"> 13. Reading Fossils: Difficulties 14. Project: Fossil Clues* 15. Reading Fossils: Reconstruction 16. Project: Label the Skeleton* 17. Project: Be Creative* 18. Scientific Inquiry 19. Quiz 2: Reading Fossils 20. Special Project* 21. Test 22. Alternate Test* 23. Glossary and Credits |
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Unit 8: Records in Rock: Geology		
Assignments		
Science 500	1. Features of the Earth	14. Surface Forces (Part 2)
	2. Landforms	15. Experiment: Erosion*
	3. Experiment: Examine an Orange*	16. Living Things
	4. Layers of the Earth (Part 1)	17. Forces from Under the Surface (Part 1)
	5. Layers of the Earth (Part 2)	18. Forces from Under the Surface (Part 2)
	6. Rocks on Earth's Surface	19. Project: Volcanoes*
	7. Project: Examine a Mineral*	20. Results of Forces
	8. Kinds of Rocks	21. Quiz 2: Changes in the Earth
	9. Identifying Rocks	22. Special Project*
	10. Project: Rocks and Minerals*	23. Test
	11. Project: Rock Hunt*	24. Alternate Test*
	12. Quiz 1: Structure of the Earth	25. Glossary and Credits
	13. Surface Forces (Part 1)	

Unit 9: Cycles in Nature		
Assignments		
Science 500	1. Matter: Properties of Matter (Part 1)	13. Project: Globe*
	2. Matter: Properties of Matter (Part 2)	14. Other Natural Cycles: Phases of the Moon
	3. Experiment: Volume	15. Other Natural Cycles: Comets
	4. Matter: Changes in Matter	16. Project: Comets*
	5. Experiment: Water Container*	17. Other Natural Cycles: Life
	6. Experiment: Types of Changes*	18. Other Natural Cycles: Water Cycle
	7. Matter: Conservation	19. Experiment: Evaporation*
	8. Structure of Matter	20. Quiz 2: Other Natural Cycles
	9. Experiment: Conservation of Matter*	21. Special Project*
	10. Project: Antoine Lavoisier*	22. Test
	11. Quiz 1: Matter	23. Alternate Test*
	12. Other Natural Cycles: Seasons	24. Glossary and Credits

Unit 10: Look Ahead		
Assignments		
Science 500	1. Living Things: Plant Life	13. The Earth: Changes in the Earth
	2. Living Things: Plants and Fungi	14. Project: Landforms*
	3. Experiment: Mitosis and Budding*	15. Quiz 2: The Earth
	4. Living Things: Animal Life	16. Order: Energy
	5. Project: Organs and Tissue*	17. Order: Work
	6. Living Things: Animals and Protozoa	18. Project: Make A Collage*
	7. Project: Organism Report*	19. Order: Matter
	8. Living Things: Balance of Life	20. Quiz 3: Order
	9. Project: Use the News*	21. Special Project *
	10. Quiz 1: Living Things	22. Test
	11. The Earth: Fossils	23. Alternate Test*
	12. The Earth: Records of Rock	24. Glossary and Credits

(*) Indicates alternative assignment