

Science 500

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 | |
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| 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 | | |
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| 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 | | |
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| 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 | | |
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| 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 | | |
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| Assignments | | |
| Science 500 | 1. Energy | 14. Quiz 3: Chemical Energy |
| | 2. Forms of Energy | 15. Energy Concerns |
| | 3. Work | 16. Future Sources (Part 1) |
| | 4. Quiz 1: Energy and Work | 17. Future Sources (Part 2) |
| | 5. Work From Energy | 18. Project: Energy* |
| | 6. Sources of Heat Energy (Part 1) | 19. Experiment: Sunlight* |
| | 7. Experiment: Paperclip* | 20. Project: Survey* |
| | 8. Experiment: Heat Energy* | 21. Quiz 4: Present Energy Concerns |
| | 9. Sources of Heat Energy (Part 2) | 22. Special Project* |
| | 10. Experiment: Chemical Energy* | 23. Test |
| | 11. Quiz 2: Work From Energy | 24. Alternate Test* |
| | 12. Chemical Energy | 25. Glossary and Credits |
| | 13. Energy Change | |

| Unit 6: Physical Geology | | |
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| Assignments | | |
| Science 500 | 1. Earth Structures | 10. Project: Weathering* |
| | 2. Internal Structure | 11. Quiz 2: Earth Changes |
| | 3. Igneous Structures | 12. Plate Tectonics |
| | 4. Project: Volcanoes* | 13. Quiz 3: Plate Tectonics |
| | 5. Mountains | 14. Special Project* |
| | 6. Quiz 1: Earth Structures | 15. Test |
| | 7. Earth Changes | 16. Alternate Test* |
| | 8. Erosion and Sediment | 17. Glossary and Credits |
| | 9. Oceans | |

| Unit 7: Records in Rock: Fossils | | |
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| Assignments | | |
| Science 500 | 1. Fossil Formation | 13. Reading Fossils: Difficulties |
| | 2. Experiment: Fossils | 14. Project: Fossil Clues* |
| | 3. Experiment: Cast Fossil* | 15. Reading Fossils: Reconstruction |
| | 4. Fossil Formation: More Fossil Types | 16. Project: Label the Skeleton* |
| | 5. Fossil Formation: Location | 17. Project: Be Creative* |
| | 6. Fossil Formation: Local Deposits | 18. Scientific Inquiry |
| | 7. Project: Look for Fossils* | 19. Quiz 2: Reading Fossils |
| | 8. Quiz 1: Fossil Formation | 20. Special Project* |
| | 9. Reading Fossils: Identification | 21. Test |
| | 10. Reading Fossils: Animal Fossils (Part 1) | 22. Alternate Test* |
| | 11. Reading Fossils: Animal Fossils (Part 2) | 23. Glossary and Credits |
| | 12. Project: Plants and Animals* | |

| Unit 8: Records in Rock: Geology | | | |
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| 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 | |