

CURRICULUM OVERVIEW

Science 500



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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						
	Assig	nments					
	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			
00	4.	Project: Robert Hooke*	17.	Energy of Cells			
e 500	5.	General Cell Composition	18.	Reproduction of Cells			
Science	6.	Quiz 1: Living Units	19.	Project: Anton Van Leeuwenhoek*			
Sci	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			

	_	2: Plants: Life Cycles nments	_		_
÷	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*	
500	4.	Project: Draw Flowers*	16.	Quiz 2: Spore Bearing Plants	
ce :	5.	Experiment: Seed Dissection*	17.	Algae	
Science	6.	Seed Bearing Plants: Cone Bearing Plants	18.	One-celled Fungi: Yeasts	
Š	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				
	1.	Invertebrates: Life Cycles		
	2.	One-celled Organisms		
	3.	Project: Protozoa*		
	4.	Multicellular Invertebrate		

e 50	4.	Multicellular Invertebrates
Science	5.	Experiment: Mealworm*
Sci	6.	Project: Spiders*
	7.	Project: Insect Study*
	8.	Worms and Mollusks
	9.	Quiz 1: Invertebrates
	10.	Vertebrates: Life Cycles

11. Egg-Laying Vertebrates (Part 1)

12. Egg-Laying Vertebrates (Part 2)

- 13. Egg-Laying Vertebrates (Part 3)
- 14. Experiment: Chicken Egg*
- 15. Live-Bearing Vertebrates
- 16. Project: Mammals*
- 17. Quiz 2: Vertebrates
- 18. Special Project*
- 19. Test
- 20. Alternate Test*
- 21. Glossary and Credits

Unit 4:	Tho	Mah	of I	ifo
Unit 4:	Ine	web		.ne

Assignments 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* Project: Prairie Food Chain* 16. Mineral Cycle 17. Project: Special Environments* 4. Science 500 5. Project: Cycles* 18. Quiz 2: The Prairie Web of Life Balance of Nature: Dependence 19. Humans and the Web of Life (Part 1) 6. Project: Food Chain* Humans and the Web of Life (Part 2) 7. 20. 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)

Accie	Unit 5: Transformation Of Energy Assignments					
	,	1.4	Ouis 2: Chamiael France.			
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					

	Assig	nments		
	1.	Earth Structures	10.	Project: Weathering*
500	2.	Internal Structure	11.	Quiz 2: Earth Changes
e 5(3.	Igneous Structures	12.	Plate Tectonics
Science	4.	Project: Volcanoes*	13.	Quiz 3: Plate Tectonics
Scie	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						
	Assignments						
	1.	Fossil Formation	13.	Reading Fossils: Difficulties			
	2.	Experiment: Fossils	14.	Project: Fossil Clues*			
	3.	Experiment: Cast Fossil*	15.	Reading Fossils: Reconstruction			
500	4.	Fossil Formation: More Fossil Types	16.	Project: Label the Skeleton*			
ice	5.	Fossil Formation: Location	17.	Project: Be Creative*			
Science	6.	Fossil Formation: Local Deposits	18.	Scientific Inquiry			
S	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 6: Physical Geology

	Unit	8: Records in Rock: Geology		
	Assig	gnments		
	1.	Features of the Earth	14.	Surface Forces (Part 2)
	2.	Landforms	15.	Experiment: Erosion*
	3.	Experiment: Examine an Orange*	16.	Living Things
Q	4.	Layers of the Earth (Part 1)	17.	Forces from Under the Surface (Part 1)
s 500	5.	Layers of the Earth (Part 2)	18.	Forces from Under the Surface (Part 2)
Science	6.	Rocks on Earth's Surface	19.	Project: Volcanoes*
Scie	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		
	Assig	nments		

	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
500	4.	Matter: Changes in Matter	16.	Project: Comets*
	5.	Experiment: Water Container*	17.	Other Natural Cycles: Life
Science	6.	Experiment: Types of Changes*	18.	Other Natural Cycles: Water Cycle
Š	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

	Assig	Assignments					
	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			
500	4.	Living Things: Animal Life	16.	Order: Energy			
ice	5.	Project: Organs and Tissue*	17.	Order: Work			
Science	6.	Living Things: Animals and Protozoa	18.	Project: Make A Collage*			
S	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