Lower School Science

The Lower School Science program follows an internationally benchmarked science education program, Next Generation Science Standards. Taught by two full-time science specialists in two dedicated science labs, the program is designed to help students in Pre-Kindergarten through Grade 5 begin to develop an understanding of the four core disciplinary areas: physical sciences; life sciences; earth and space sciences; and engineering/technology. In the earlier grades, students begin recognizing patterns and formulating answers to questions about the world around them. By the end of Fifth Grade, students are able to demonstrate grade-appropriate proficiency in gathering, describing, and using information about the natural and designed world.

The performance expectations for the students in our Lower School include developing ideas and skills that will allow them to explain more complex phenomena in the four disciplines as they progress to Middle and Upper School.

<table>
<thead>
<tr>
<th>Lower School Science</th>
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<tbody>
<tr>
<td><strong>PRE-K</strong></td>
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<td>Pre-K Science is based on developmentally appropriate practices as outlined by the NAEYC (National Association for the Education of Young Children). Taking advantage of preschoolers’ curiosity about their world, teachers focus on the uses and processes of science in children’s everyday lives.</td>
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<tr>
<td><strong>Topics &amp; Skills:</strong> Teachers provide interesting experiences and materials to convey key scientific concepts (e.g., weight, light, cause and effect)</td>
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<tr>
<td><strong>PHYSICAL SCIENCE:</strong> Materials in Our World</td>
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<tr>
<td>- Observe and compare physical properties of different kinds of wood samples, using the senses</td>
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<tr>
<td>- Observe and compare properties and structures of different kinds of paper and fabric</td>
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<td>- Observe how wood, paper, and fabric interact with water</td>
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<td>- Explore the technology of making wood products</td>
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<td>- Observe and describe how where fabrics are used</td>
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<td>- Observe, describe, and mix earth materials with water to observe properties</td>
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<td>- Communicate observations made about different kinds of materials, orally and through drawings</td>
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<td>- Continued continued</td>
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continued
**PRE-K**
- patterns, and discover relationships
- Recording and documenting investigations is important to make processes visible and allow children to go back to the beginning of a change or see a pattern over time

**Specific Topic:**
- Worms

<table>
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<tr>
<th>LIFE SCIENCE:</th>
<th>KINDERGARTEN</th>
<th>GRADE 1</th>
<th>GRADE 2</th>
<th>GRADE 3</th>
<th>GRADE 4</th>
<th>GRADE 5</th>
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| Animals Two by Two | - Develop a growing curiosity and interest in the living world around us  
  - Observe and describe the structures of a variety of common animals—fish, snails, redworms, isopods  
  - Compare structures and behaviors of different pairs of animals  
  - Observe interactions of animals with their surroundings  
  - Handle animals carefully, and participate in the care and feeding of classroom animals  
  - Communicate observations and comparisons  
  - Acquire vocabulary associated with the structure and behavior of animals  
  - Acquire the vocabulary associated with the structure and behavior of worms | - Observations through drawing and writing  
  - Acquire vocabulary associated with properties of air  
  - The Science of Color  
    - Primary and secondary colors  
    - Mixing of colors  
    - Camouflage | - Hydroelectric power; energy used by household appliances  
  - Design Thinking with Air-Powered Rockets  
    - Collaborate to design a rocket using construction paper, masking tape, and 20 grams of clay to be launched with 45 lbs of pressure from the PVC rocket launcher  
  - Record observations  
  - Use measurement, including mass in grams and length in centimeters | - Chemistry  
  - Acids, Bases and Indicators; pH scale  
  - Types and causes of chemical reactions  
  - Types of chemical mixtures | - Inventors  
  - Rube Goldberg  
  - History of inventions  
  - Design Thinking: brainstorming, design, development of prototype, and final model of product Rocketry | - History of rockets  
  - Newton's Laws  
  - Aerodynamics  
  - Model rocket building |
| Tadpoles and Frogs | - Develop a growing curiosity and interest in the living world around us  
  - Observe and describe the structures of frogs  
  - Observe frog life cycle (frog spawn, tadpole, front legs, back legs, pulmonary breathing, adult)  
  - Observe interactions of animals with their habitat/ surroundings  
  - Communicate observations and comparisons  
  - Acquire the vocabulary associated with the structure and behavior of frogs  | - Butterflies and Moths  
  - Larvae body parts  
  - Pupal stages  
  - Camouflage and mimicry  
  - Metamorphosis  
  - Adult body parts  
  - Life cycles  
  - Plants  
  - Observation and data collection  
  - Growth  
  - Parts | - Floating and Sinking  
  - Objects and materials that take up space and can be compressed into a can  
  - Properties of matter  
  - Properties of water  
  - Properties of magnetic fields  
  - Properties of materials  | | - Types of man-made energy/natural energy  
  - Energy transfer and transformation Inventions | |
| Woody's Pond Environment | - Environmental etiquette  
  - Bird species  
  - Animal tracks  
  - Pond species  
  - Pond ecosystem  
  - Trees  | - Prairie Ecology  
  - Explore the ecosystem as an organizational unit of life on Earth  
  - Explore role, structures, and behaviors of Colorado prairie organisms  
  - Learn about independent relationships in ecosystems  
  - Study organization for Matter and Energy flow in organisms | - EARTH SCIENCE:  
  - Weather  
  - Temperature  
  - Wind  
  - Clouds  
  - Precipitation  
  - Storm systems  | - Circulatory System—Blood & Heart  
  - Function and components of blood  
  - Types and roles of blood vessels  
  - Benefits of donating blood  
  - Function of heart  
  - Chambers of heart  
  - Circulation of blood in heart Health and Wellness  
  - Healthy Habits: nutrition, sleep, exercise, hygiene  
  - Germs: detection and prevention, includes presentation to younger students  
  - Bird Watching at Woody's Pond  
  - Methods for identification  
  - Identify bird species  
  - Count and record birds for Cornell Lab of Ornithology | - Map reading  
  - History of inventions  
  - Model rocket building | |
| Prairie Ecology | - Explore the ecosystem as an organizational unit of life on Earth  
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  - Learn about independent relationships in ecosystems  
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  - Space and the Solar System  
  - Lunar phases  
  - Composition of Moon  
  - Origin of the solar system  
  - Planets and objects in space  
  - History of space travel | - Crow Canyon—Archaeology  
  - Archaeology  
  - Research design  
  - Excavation | |