

NATIONAL SCIENCE EDUCATION STANDARDS

Classroom Science from A to Z

| GRADE | CATEGORY | SUB-CATEGORY | STANDARD |
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| K-4 | Earth and Space Science | Changes In The Earth And Sky | Objects in the sky have patterns of movement. The sun, for example, appears to move across the sky in the same way every day, but its path changes slowly over the seasons. The moon moves across the sky on a daily basis much like the sun. The observable shape of the moon changes from day to day in a cycle that lasts about a month. |
| K-4 | Earth and Space Science | Changes In The Earth And Sky | The surface of the earth changes. Some changes are due to slow processes, such as erosion and weathering, and some changes are due to rapid processes, such as land-slides, volcanic eruptions, and earthquakes. |
| K-4 | Earth and Space Science | Changes In The Earth And Sky | Weather changes from day to day and over the seasons. Weather can be described by measureable quantities, such as temperature, wind direction, and speed, and precipitation. |
| K-4 | History and Nature of Science | Science As A Human Endeavor | Although men and women using scientific inquiry have learned much about the objects, events, and phenomena in nature, much more remains to be understood. Science will never be finished. |
| K-4 | History and Nature of Science | Science As A Human Endeavor | Many people choose science as a career and devote their entire lives to studying it. Many people derive great pleasure from doing science. |
| K-4 | History and Nature of Science | Science As A Human Endeavor | Men and women have made a variety of contributions throughout the history of science and technology. |
| K-4 | History and Nature of Science | Science As A Human Endeavor | Science and technology have been practiced by people for a long time. |
| K-4 | Physical Science | Light, Heat, Electricity, and Magnetism | Electricity in circuits can produce light, heat, sound, and magnetic effects. Electrical circuits require a complete loop through which an electrical current can pass. |

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| K-4 | Physical Science | Light, Heat, Electricity, and Magnetism | Heat can be produced in many ways, such as burning, rubbing, or mixing one substance with another. Heat can move from one object to another by conduction. |
| K-4 | Physical Science | Light, Heat, Electricity, and Magnetism | Light travels in a straight line until it strikes an object. Light can be reflected by a mirror, refracted by a lens, or absorbed by the object. |
| K-4 | Physical Science | Light, Heat, Electricity, and Magnetism | Magnets attract and repel each other and certain kinds of other materials. |
| K-4 | Physical Science | Position and Motion of Objects | An object's motion can be described by tracing and measuring its position over time. |
| K-4 | Physical Science | Position and Motion of Objects | Position of an object can be described by locating it relative to another object or the background. |
| K-4 | Physical Science | Position and Motion of Objects | Sound is produced by vibrating objects. The pitch of the sound can be varied by changing the rate of vibration. |
| K-4 | Physical Science | Position and Motion of Objects | The position and motion of objects can be changed by pushing or pulling. The size of the change is related to the strength of the push or pull. |
| K-4 | Physical Science | Properties of Objects and Materials | Materials can exist in different states- solid, liquid, and gas. Some common materials such as water, can be changed from one state to another by heating or cooling. |
| K-4 | Physical Science | Properties of Objects and Materials | Objects are made of one or more materials, such as paper, wood, and metal. Objects can be described by the properties of the materials from which they are made, and those properties can be used to separate or sort a group of objects or materials. |
| K-4 | Physical Science | Properties of Objects and Materials | Objects have many observable properties, including size, weight, shape, color, temperature, and the ability to react with other substances. Those properties can be measured using tools, such as rulers, balances, and thermometers. |
| K-4 | Science and Technology | Abilities of Technological Design | Communicate a problem, design, and solution. |
| K-4 | Science and Technology | Abilities of Technological Design | Evaluate a product or design. |
| K-4 | Science and Technology | Abilities of Technological Design | Identify a simple problem. |

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| K-4 | Science and Technology | Abilities of Technological Design | Implementing proposed solutions. |
| K-4 | Science and Technology | Abilities of Technological Design | Propose a solution. |
| K-4 | Science and Technology | Understanding About Science And Technology | People have always had problems and invented tools and techniques (ways of doing something) to solve problems. Trying to determine the effects of solutions helps people avoid some new problems. |
| K-4 | Science and Technology | Understanding About Science And Technology | People have always had questions about their world. Science is one way of answering questions and explaining the natural world. |
| K-4 | Science and Technology | Understanding About Science And Technology | Scientists and engineers often work in teams with different individuals doing different things that contribute to the results. This understanding focuses primarily on teams working together and secondarily, on the combination of scientist and engineer teams. |
| K-4 | Science and Technology | Understanding About Science And Technology | Tools help scientists make better observations, measurements, and equipment for investigations. They help scientists see, measure, and do things that they could not otherwise see, measure, and do. |
| K-4 | Science and Technology | Understanding About Science And Technology | Women and men of all ages, backgrounds, and groups engage in a variety of scientific and technological work. |
| K-4 | Science as Inquiry | Abilities Necessary To Do Scientific Inquiry | Ask a question about objects, organisms, and events in the environment. |
| K-4 | Science as Inquiry | Abilities Necessary To Do Scientific Inquiry | Employ simple equipment and tools to gather data and extend the senses. |
| K-4 | Science as Inquiry | Abilities Necessary To Do Scientific Inquiry | Plan and conduct a simple investigation. |
| K-4 | Science as Inquiry | Abilities Necessary To Do Scientific Inquiry | Use data to construct a reasonable explanation. |
| 5-8 | Science and Technology | Understanding About Science And Technology | Technological designs have constraints. |
| 5-8 | Science and Technology | Understanding About Science And Technology | Technology solutions have intended benefits and unintended consequences. |

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| 5-8 | Science as Inquiry | Abilities Necessary To Do Scientific Inquiry | Communicate scientific procedures and explanations. |
| 5-8 | Science as Inquiry | Abilities Necessary To Do Scientific Inquiry | Design and conduct a scientific investigation. |
| 5-8 | Science as Inquiry | Abilities Necessary To Do Scientific Inquiry | Develop descriptions, explanations, predictions, and models using evidence. |
| 5-8 | Science as Inquiry | Abilities Necessary To Do Scientific Inquiry | Identify questions that can be answered through scientific investigations. |
| 5-8 | Science as Inquiry | Abilities Necessary To Do Scientific Inquiry | Recognize and analyze alternative explanations and predictions. |
| 5-8 | Science as Inquiry | Abilities Necessary To Do Scientific Inquiry | Think critically and logically to make the relationships between evidence and explanations. |
| 5-8 | Science as Inquiry | Abilities Necessary To Do Scientific Inquiry | Use appropriate tools and techniques to gather and analyze, and interpret data. |
| 5-8 | Science as Inquiry | Abilities Necessary To Do Scientific Inquiry | Use mathematics in all aspects of scientific inquiry. |