# Fourth Grade Science

**5.1 Science Practices:** All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.

TSW = The Student Will

| Objective(s) | NJCCCS Alignment | Essential Questions | Understandings | Suggested Assessment Activities |
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| • TSW measure, gather, evaluate, and share evidence using tools and technologies<br>• TSW justify explanations with reasonable and logical arguments<br>• TSW present evidence to interpret and/or predict cause-and-effect outcomes of investigations<br>• TSW handle and treat organisms humanely, responsibly, and ethically | 5.1.4.B<br>5.1.4.B<br>5.1.4.C<br>5.1.4.D | - What is science?<br>- How does inquiry relate to scientific method?<br>- What do results tell about an investigation?<br>- How are accomplishments measured?<br>- How is data organized?<br>- What role do scientists have in an investigation?<br>- | • Science includes observations, collection of data, and communication skills<br>• Results may remain consistent or vary in an investigation<br>• There are various ways to represent scientific data<br>• Questions and predictions can be addressed by conducting investigations<br>• Descriptions, explanations, predictions, and models are developed using evidence | Ongoing observation & questioning during class discussions and hands-on project work<br>Keep notebooks that describe observations. Notebook entries should be clear and comprehensive so that future reference is understandable<br>Outline various solutions to a design problem and share with classmates<br>Create Venn Diagrams showing similar results in replicated investigations |

# Fourth Grade Science

**5.2 Physical Science:** All students will understand that physical science principles, including fundamental ideas about matter, energy, and motion, are powerful conceptual tools for making sense of phenomena in physical, living, and Earth systems science.

TSW = The Student Will

| Objective(s) | NJCCCS Alignment | Essential Questions | Understandings | Suggested Assessment Activities |
|---|---|---|---|---|
| • TSW plan and carry out an investigation to distinguish among solids, liquids, and gasses<br>• TSW categorize objects based on the ability to absorb or reflect light and conduct heat or electricity<br>• TSW explain what happens when a common substance, such as shortening or candle wax, is heated to melting and then cooled to a solid<br>• TSW compare the flow of heat through metals and nonmetals by taking and analyzing measurements<br>• TSW illustrate and explain what happens when light travels from air into water<br>• TSW repair an electric circuit<br>• TSW investigate and categorize materials based on their interaction with magnets | 5.2.4.A<br>5.2.4.A<br>5.2.4.B<br>5.2.4.C<br>5.2.4.C<br>5.2.4.D<br>5.2.4.E | - What is motion?<br>- How would the universe be different if one or more of the laws of motion were suspended??<br>- How do we know that things have energy?<br>- How can energy be changed?<br>- In what ways can things change?<br>- How can matter (water or wood) change?<br>- What determines the type of chemical reaction that can occur? | • Matter is neither created nor destroyed, though it can change form<br>• Matter can be described according to physical properties<br>• When two or more substances interact to form new substances, the properties of the new combinations may be very different from those of the old<br>• Motion can be measured<br>• The greater the force, the greater the change in motion<br>• Energy takes many forms<br>• Light is a form of energy | Ongoing observation & questioning during class discussions and hands-on project work<br>Describe how matter changes from a liquid to a solid to a gas<br>Investigate several types of chemical reactions to observe changes in properties and mass<br>Design or construct a ramp that will control speed and direction<br>Design a simple circuit using several light bulbs and one battery |

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| • TSW investigate, construct, and generalize rules for the effect that force of gravity has on balls of different sizes and weights | 5.2.4.E | | | |

Grade 4 **Physical Science** continued

# Fourth Grade Science

**5.3 Life Science**: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.

TSW = The Student Will

| Objective(s) | NJCCCS Alignment | Essential Questions | Understandings | Suggested Assessment Activities |
|---|---|---|---|---|
| • TSW **c**ompare and contrast structures that have similar functions in various organisms<br>• TSW describe the interactions of systems involved in carrying out everyday life activities<br>• TSW understand that organisms can only survive in environments in which their needs are met<br>• TSW compare the physical characteristics of the different stages of the life cycle<br>• TSW compare the characteristics of life stages among species<br>• TSW model an adaptation to a species that would increase its chances of survival | 5.3.4.A<br>5.3.4.A<br>5.3.4.C<br>5.3.4.D<br>5.3.4.D<br>5.3.4.E | - How do organisms change as they go through their life cycles?<br>- How are organisms classified?<br>- How do humans impact our environment?<br>- Why is a food chain important for the survival of organisms? | • Each system of the body includes an organ that performs an important function for living<br>• The sun is the beginning of the food chain<br>• Living organisms grow according to a life cycle<br>• The environment can support or harm the life cycle of organisms | Ongoing observation & questioning during class discussions and hands-on project work<br>Pick a food product and trace the energy back to the sun<br>Observe and identify structures of plants and describe the function of each structure<br>Investigate different biomes and animal habitats |

# Fourth Grade Science

**5.4 Earth Systems Science**: All students will understand that Earth operates as a set of complex, dynamic, and interconnected systems, and is a part of the all-encompassing system of the universe.

TSW = The Student Will

| Objective(s) | NJCCCS Alignment | Essential Questions | Understandings | Suggested Assessment Activities |
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| • TSW explain how shadows could be used to tell the time of day<br>• TSW generate a model with explanatory value that explains why objects roll down ramps<br>• TSW understand why the Moon orbits Earth<br>• TSW use data gathered from observations of fossils to determine whether a given fossil is terrestrial or marine in origin<br>• TSW understand that fossils provide evidence about the plants and animals that lived long ago<br>• TSW categorize unknown samples as either rocks or minerals<br>• TSW predict temperature changes of Earth materials | 5.4.4.A<br>5.4.4.A<br>5.4.4.A<br>5.4.4.B<br>5.4.4.B<br>5.4.4.C<br>5.4.4.E | - What story does a fossil tell?<br>- How does the weather affect our daily lives?<br>- What is fog?<br>- What causes rapid change to the Earth's surface?<br>- How can our understanding of rapid changes influence our decisions?<br>- What predictable, observable patterns occur as a result of the interactions between the Earth, Moon, and Sun? | • Water, wind, and ice change the Earth's surface<br>• Fossils are preserved remains from the past<br>• Weather affects us in diverse ways<br>• The surface of the Earth changes<br>• Precipitation comes from clouds, but not all clouds produce precipitation<br>• Changes occur in the night sky | Ongoing observation & questioning during class discussions and hands-on project work<br>Identify and describe weather patterns and their effect on our daily lives<br>Illustrate a map using physical features<br>Have students draw pictures of day and night sky. Record observations pictorially, orally, and in writing<br>Describe and illustrate the phases of the moon<br>Examine different sets of identified fossils. Students draw sketches of the fossils and determine the time and environment in which the organism lived. |

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| • TSW identify patterns in data collected from basic weather instruments<br>• TSW model how the properties of water can change as water moves through the water cycle | 5.4.4.F<br>5.4.4.G | | | |

Grade 4 **Earth Systems Science** continued