Core Content	Supporting Books
SC-05-1.1.1 **Students will describe the physical properties of substances (e.g., boiling point, solubility, density).** **A substance has characteristic physical properties (e.g., boiling point, solubility, density) that are independent of the amount of the sample.**	Burnie, D., Challoner, J., Cooper, C., Lafferty, P., Newmark, A., Parker, S. (2004). *Science explorer.* New York: DK Publishing, Inc. Fiarotta, W. & P. (1997). *Great experiments with H2O.* New York: Sterling Publishing Co. Oxlade, C. (2007). *States of matter.* Chicago: Heinemann Library. Parker, S. (2005). *The science of water.* Chicago: Heinemann Library.
SC-05-1.2.1 **Students will interpret data in order to make qualitative (e.g., fast, slow, forward, backward) and quantitative descriptions and predictions about the straight-line motion of an object.** **The motion of an object can be described by its relative position, direction of motion and speed. That motion can be measured and represented on a graph.**	Cooper, C. (2004). *Forces and motion.* Chicago: Heinemann Library. Hammond, R. (2006). *Can you feel the force?* New York: DK Publishing, Inc.
SC-05-1.2.2 *Students will understand that forces are pushes and pulls, and that these pushes and pulls may be invisible (e.g., gravity, magnetism) or visible (e.g., friction, collisions).*	Cooper, C. (2004). *Forces and motion.* Chicago: Heinemann Library. Hammond, R. (2006). *Can you feel the force?* New York: DK Publishing, Inc. Stringer, J. (2000). *The science of gravity.* Austin, TX: Raintree Steck-Vaughn Publishers.
SC-05-2.3.1 **Students will:** • **describe the circulation of water (evaporation and condensation)**	Burnie, D., Challoner, J., Cooper, C., Lafferty, P., Newmark, A., Parker, S. (2004). *Science explorer.* New York: DK Publishing, Inc.

from the surface of the Earth, through the crust, oceans and atmosphere (water cycle); • **explain how matter is conserved in this cycle.** **Water, which covers the majority of the Earth's surface, circulates through the crust, oceans and atmosphere in what is known as the water cycle. This cycle maintains the world's supply of fresh water. Students should have experiences that contribute to the understanding of evaporation, condensation and the conservation of matter.**	Cole, J. & Degen, B. (1986). *The magic school bus at the waterworks.* New York: Scholastic, Inc. Parker, S. (2005). *The science of water.* Chicago: Heinemann Library. Wick, W. (1997). *A drop of water.* New York: Scholastic, Inc.
SC-05-2.3.2 **Students will explain interactions of water with Earth materials and results of those interactions (e.g., dissolving minerals, moving minerals and gases).** **Water dissolves minerals and gases and may carry them to the oceans.**	Burnie, D., Challoner, J., Cooper, C., Lafferty, P., Newmark, A., Parker, S. (2004). *Science explorer.* New York: DK Publishing, Inc. Rose, S. (2000). *Earth.* New York: DK Publishing, Inc.
SC-05-2.3.3 **Students will:** • **describe Earth's atmosphere as a relatively thin blanket of air consisting of a mixture of nitrogen, oxygen and trace gases, including water vapor;** • **analyze atmospheric data in order to draw conclusions about real life phenomena related to atmospheric changes and conditions.** **Earth is surrounded by a relatively thin blanket of air called the atmosphere. The atmosphere is a mixture of nitrogen, oxygen and trace gases that include water vapor. The atmosphere has different properties at different elevations. Conclusions based on the interpretation of atmospheric data can be used to explain real life phenomena (e.g., pressurized cabins in airplanes, mountain-climber's need for oxygen).**	Burnie, D., Challoner, J., Cooper, C., Lafferty, P., Newmark, A., Parker, S. (2004). *Science explorer.* New York: DK Publishing, Inc. Rose, S. (2000). *Earth.* New York: DK Publishing, Inc. Rupp, R. (2003). *Weather!* North Adams, MA: Storey Publishing. Vogt, G. (2007). *The atmosphere: planetary heat engine.* Minneapolis: Twenty-First Century Books.

SC-05-2.3.4 **Students will:** • **analyze global patterns of atmospheric movement;** • **explain the basic relationships of patterns of atmospheric movement to local weather.** **Global patterns of atmospheric movement can be observed and/or analyzed by interpreting patterns within data. Atmospheric movements influence local weather. Oceans have a major effect on climate, because water in the oceans holds a large amount of heat. Related data can be used to predict change in weather and climate.**	Breen, M. & Friestad, K. (2000). *The kids' book of weather forecasting.* Nashville, TN: Williamson Books. Cosgrove, B. (2004). *Eyewitness: Weather.* New York: DK Publishing, Inc. Rupp, R. (2003). *Weather!* North Adams, MA: Storey Publishing. Singer, M. (2000). *On the same day in March: A tour of the world's weather.* New York: HarperCollins. Vogt, G. (2007). *The atmosphere: planetary heat engine.* Minneapolis: Twenty-First Century Books.
SC-05-2.3.5 **Students will compare components of our solar system, including using models/representations that illustrate the system.** **Earth is the third planet from the Sun in a system that includes the moon, the Sun, eight other planets and their moons, and smaller objects. The Sun, an average star, is the central and largest body in the solar system. Models/diagrams provide understanding of scale within the solar system.**	Bond, P. (1999). *DK guide to space.* New York: DK Publishing, Inc. Cole, J. & Degen, B. (1990). *The magic school bus: lost in the solar system.* New York: Scholastic, Inc. Graun, K. & Maly, S. (2002). *Our galaxy and the universe.* Tucson, AZ: Ken Press. Hansen, R. & Bell, R. (1985). *My first book of space.* New York: Simon & Schuster. Holland, S. (2001). *Space.* New York: DK Publishing, Inc. Landau, E. (2008). *The moon.* New York: Scholastic, Inc. Landau, E. (2008). *The sun.* New York: Scholastic, Inc. Levy, D. (2003). *Stars & planets.* New York: Barnes & Noble. Simon, S. (1992). *Our solar system.* New York: Morrow Junior Books.

SC-05-3.4.1 **Students will describe and compare living systems to understand the complementary nature of structure and function.** **Observations and comparisons of living systems at all levels of organization illustrate the complementary nature of structure and function. Important levels of organization for structure and function include cells, tissues, organs, organ systems, organisms (e.g., bacteria, protists, fungi, plants, animals), and ecosystems. Examining the relationship between structure and function provides a basis for comparisons and classification schemes.**	Ballance, A. (2002). *Divers.* Parsippany, NJ: Dominie Press. Ballance, A. (2002). *Spinners and weavers.* Parsippany, NJ: Dominie Press. Ballance, A. (2002). *Swimmers.* Parsippany, NJ: Dominie Press. Dipper, F. (2002). *Guide to the oceans.* New York: DK Publishing, Inc. Farndon, J. (2006). *Flowers.* Farmington Hills, MI: Blackbirch Press. Farndon, J. (2006). Leaves. Farmington Hills, MI: Blackbirch Press. Farndon, J. (2006). *Roots.* Farmington Hills, MI: Blackbirch Press. Farndon, J. (2006). *Stems.* Farmington Hills, MI: Blackbirch Press. Learner, C. (1987). *A forest year.* New York: William Morrow & Co., Inc. Maestro, B. (1990). *A sea full of sharks.* New York: Scholastic, Inc. Markle, S. (2004). *Outside and inside killer bees.* New York: Walker & Company. Souza, D. (2007). *Look what feet can do.* Minneapolis: Lerner Publications Co. Souza, D. (2007). *Look what tails can do.* Minneapolis: Lerner Publications Co. Souza, D. (2007). *Look what whiskers can do.* Minneapolis: Lerner Publications Co. Turner, M. (2005). *Animals under threat: Asian elephant.* Chicago: Heinemann Library.

SC-05-3.4.2 **Students will explain the essential functions of cells necessary to sustain life.** **Cells carry on the many functions needed to sustain life. Models of cells, both physical and analogical, promote understanding of their structures and functions. Cells grow and divide, thereby producing more cells. This requires that they take in nutrients, which provide energy for the work that cells do and make the materials that a cell needs.**	Balkwill, R. (1993). *Amazing schemes within your genes.* Minneapolis: Carolrhoda Books, Inc. Balkwill, R. (1993). *Cells are us.* Minneapolis: Carolrhoda Books, Inc. Balkwill, R. (1993). *Enjoy your cells.* Minneapolis: Carolrhoda Books, Inc.
SC-05-3.4.3 *Students will understand that all organisms are composed of cells, the fundamental unit of life. Most organisms are single cells; other organisms, including plants and animals are multicellular.*	Balkwill, R. (1993). *Amazing schemes within your genes.* Minneapolis: Carolrhoda Books, Inc. Balkwill, R. (1993). *Cells are us.* Minneapolis: Carolrhoda Books, Inc. Balkwill, R. (1993). *Enjoy your cells.* Minneapolis: Carolrhoda Books, Inc.
SC-05-3.5.1 **Students will describe cause and effect relationships between enhanced survival/reproductive success and particular biological adaptations (e.g., changes in structures, behaviors, and/or physiology) to generalize about the diversity of populations of organisms.** **Biological change over time accounts for the diversity of populations developed through gradual processes over many generations. Examining cause and effect relationships between enhanced survival/reproductive success and biological adaptations (e.g., changes in structures, behaviors, and/or physiology), based on evidence gathered, creates the basis for explaining diversity.**	Barraclough, S. (2005). *Bugs: the world's most terrifying insects.* New York: Backpack Books. Dipper, F. (2002). *Guide to the oceans.* New York: DK Publishing, Inc. Greenwood, E. (2001). *Rain forest.* New York: DK Publishing, Inc. Holland, S. (2002). *Reptiles.* New York: DK Publishing, Inc. Mack, L. (2006). *Arctic & Antarctic.* New York: DK Publishing, Inc. Machotka, H. (1991). *What neat feet!* New York: Morrow Junior Books. Markle, S. (2004). *Outside and inside killer bees.* New York: Walker & Company.

	Settel, J. (1999). *Exploding ants.* New York: Atheneum Books for Young Readers. Souza, D. (2007). *Look what feet can do.* Minneapolis: Lerner Publications Co. Souza, D. (2007). *Look what tails can do.* Minneapolis: Lerner Publications Co. Souza, D. (2007). *Look what whiskers can do.* Minneapolis: Lerner Publications Co. Turner, M. (2005). *Animals under threat: Asian elephant.* Chicago: Heinemann Library.
SC-05-3.5.2 *Students will understand that all organisms must be able to obtain and use resources, grow, reproduce, and maintain stable internal conditions while living in a constantly changing external environment.*	Ballance, A. (2002). *Builders.* Parsippany, NJ: Dominie Press. Ballance, A. (2002). *Thieves and rascals.* Parsippany, NJ: Dominie Press. Holland, S. (2002). *Reptiles.* New York: DK Publishing, Inc. Lauber, P. (1994). *Fur, feathers, and flippers.* New York: Scholastic, Inc. Lerner, C. (1987). *A forest year.* New York: William Morrow & Co., Inc. Mack, L. (2006). *Arctic & Antarctic.* New York: DK Publishing, Inc. Turner, M. (2005). *Animals under threat: Asian elephant.* Chicago: Heinemann Library. Woodford, C. (2007). *Energy.* New York: DK Publishing, Inc.

SC-05-4.6.1 **Students will:** • **classify energy phenomena as kinetic or potential;** • **describe the transfer of energy occurring in simple systems or related data.** **Energy can be classified as kinetic or potential. Energy is a property of many substances and energy can be found in several different forms. For example, chemical energy as found in food we eat or in the gasoline we burn in our car. Heat, light (solar), sound, electrical energy and the energy associated with motion (called kinetic energy) are examples of other forms of energy. Objects can have energy simply by virtue of their position, called potential energy. Energy is transferred in many ways. Analyzing simple systems can provide the basis for describing the transfer of energy occurring within the system.**	Gardner, R. (2006). *Sizzling science projects with heat and energy.* Berkeley Heights: Enslow Publishers, Inc. Parker, S. (2005). *The science of air.* Chicago: Heinemann Library. Woodford, C. (2007). *Energy.* New York: DK Publishing. Woodruff, J. (1998). *Energy.* Austin, TX: Raintree Steck-Vaughn Publishers.
SC-05-4.6.2 *Students will understand that the Sun is a major source of energy for changes on Earth's surface. The Sun loses energy by emitting light. A tiny fraction of that light reaches Earth, transferring energy from the Sun to Earth.*	Gardner, R. (2008). *Far out science experiments with the sun and moon.* Berkeley Heights, NJ: Enslow Publishers, Inc. Rhatigan, J. & Newcomb, R. (2003). *Out of this world astronomy.* New York: Lark Books. Woodford, C. (2007). *Energy.* New York: DK Publishing, Inc.
SC-05-4.6.3 **Students will:** • **draw conclusions about the transfer of energy within models/representations of electrical circuits as evidenced by the heat, light, sound and magnetic effects that are produced;** • **describe changes within the system that would affect the transfer of energy.**	Gardner, R.(2008). *Energizing science projects with electricity and magnetism.* Berkeley Heights, NJ: Enslow Publishers, Inc. Gardner, R. (2004). *Electricity and magnetism science fair projects.* Berkeley Heights, NJ: Enslow Publishers, Inc. Gardner, R.(2008). *Sizzling science projects with heat and energy.* Berkeley Heights, NJ: Enslow Publishers, Inc.

Electrical circuits provide a means of transferring electrical energy. This transfer can be observed and described as heat, light, sound and magnetic effects are produced. Models and diagrams can be used to support conclusions and predict consequences of change within an electrical circuit.	Goldsmith, M. (2007). *Light and sound.* Boston: Kingfisher. Woodford, C. (2007). *Energy.* New York: DK Publishing, Inc.
SC-05-4.6.4 **Students will identify predictable patterns and make generalizations about light and matter interactions using data/evidence.** **Light energy interacts with matter by transmission (including refraction), absorption, or scattering (including reflection.**	Gardner, R. (2006). *Dazzling science projects with light and color.* Berkeley Heights, NJ: Enslow Publishers, Inc. Goldsmith, M. (2007). *Light and sound.* Boston: Kingfisher.
SC-05-4.6.5 *Students will understand that heat energy moves in predictable ways, flowing from warmer objects to cooler ones, until both objects reach the same temperature. By examining cause and effect relationships, consequences of heat movement and conduction can be predicted and inferred.*	Hammond, R. (2006). *Can you feel the force?* New York: DK Publishing, Inc. Woodruff, J. (1998). *Energy.* Austin, TX: Raintree Steck-Vaughn Publishers.
SC-05-4.7.1 **Students will:** • **describe and categorize populations of organisms according to the function they serve in an ecosystem (e.g., producers, consumers, decomposers);** • **draw conclusions about the effects of changes to populations in an ecosystem.** **Populations of organisms can be categorized by the function they serve in an ecosystem. Plants and some microorganisms are producers because they make their own food. All animals, including humans, are consumers, and obtain their food by eating other organisms. Decomposers, primarily bacteria and fungi, are consumers that use**	Arnosky, J. (1990). *Crinkleroot's guide to walking in wild places.* New York: Bradbury Press. Ballance, A. (2002). *Spinners and Weavers.* Parsippany, NJ: Dominie Press. Cone, M. (1992). *Come back, salmon.* San Francisco: Sierra Club Books. Kalman, B. (2007). *Wetland food chains.* New York: Crabtree Publishing Company. Kratter, P. (2004). *The living rain forest: An animal alphabet.* Watertown, MA: Charlesbridge Publishing.

waste materials and dead organisms for food. Food webs identify the relationships among producers, consumers and decomposers in an ecosystem. Using data gained from observing interacting components within an ecosystem, the effects of changes can be predicted.	Jenkins, S. (2006). *Almost gone: The world's rarest animals.* New York: Scholastic, Inc. Lauber, P. (1994). *Fur, feathers, and flippers: How animals live where they do.* New York: Scholastic, Inc. Learner, C. (1987). *A forest year.* New York: William Morrow & Co., Inc. Mack, L. (2006). *Arctic & Antarctic.* New York: DK Publishing, Inc. Parsons, M.H. (2005). *Pets from the rain forest.* Chicago: Wright Group. Peet, B. (1970). *The wump world.* Boston: Houghton Mifflin. Romanova, N. (1985). *Once there was a tree.* New York: Pied Piper Books.
SC-05-4.7.2 *Students will understand that a population consists of all individuals of a species that occur together at a given place and time. All populations living together and the physical factors with which they interact compose an ecosystem.*	Arnosky, J. (1990). *Crinkleroot's guide to walking in wild places.* New York: Bradbury Press. Cone, M. (1992). *Come back, salmon.* San Francisco: Sierra Club Books. Dipper, F. (2002). *Guide to the oceans.* New York: DK Publishing. Dipper, F. (2003). *Secrets of the deep revealed.* New York: DK Publishing. Greenwood, E. (2001). *Rain forest.* New York: DK Publishing, Inc. Kalman, B. (2007). *Wetland food chains.* New York: Crabtree Publishing Company.

	Parsons, M.H. (2005). *Pets from the rain forest.* Chicago: Wright Group. Wright-Frierson, V. (1996). *A desert scrapbook: Dawn to dusk in the Sonoran desert.* New York: Aladdin.