

5th Grade Science TEKS – Readiness and Supporting

[Key Document for Released STAAR Questions](#)

Icon Key: 🙌 Hands on • 🎬 Video • 📖 Reading • 💻 Computer game/simulation/interactive • 🍎 Teacher material • 🛠 General tool • 🎮 Game • 👁 Presentation

(5) Matter and Energy – The student knows that matter has measurable physical properties and those properties determine how matter is classified, changed, and used. The student is expected to do the following:

- (A) *Classify matter based on measurable, testable, and observable physical properties, including mass, magnetism, physical state (solid, liquid, and gas), relative density (sinking and floating using water as a reference point), solubility in water, and the ability to conduct or insulate thermal energy or electric energy.* **(Readiness)** [Released items](#)
 - 📖 [CK12: 2.1 Matter, Mass, and Volume](#) – This is a collection of text material about matter, mass, and volume that incorporates video and includes practice questions that students can complete online. There is a lot of focus on volume, which is not in the TEKS, but helpful concepts around matter and mass are discussed. (CK12 allows you to assign content to students through their website, or through Google Classroom.)
 - 🎬 [Crash Course Kids: Matter Matters](#) – (3:30) This video is available via YouTube; advertisements might appear before the video plays, so if the video is shown during class time, allow the advertisements to complete before showing to students. The video highlights the observable properties of matter and includes an investigation to test/observe the properties of matter. The video puts a good focus on mass and highlights the mass v. weight distinction.
 - 🎬 [Crash Course Kids: Wood, Water, and Properties](#) – (3:54) This video introduces *properties* as a vocabulary term and highlights physical states. The investigation in the video shows how states can change. As above, advertisements may play automatically before the video starts.
 - 🛠 [TEA Science Glossary](#) – This can be accessed for whole-group practice or as a resource students and families can use at home. For TEKS 5–5A, the following terms are included: *attract*, *conductor*, *insulator*, *magnetic*, *magnetism*, and *nonmagnetic*.
 - 🍎🙌 [The Power of Magnetism: Lesson Plan](#) – This is a free lesson plan resource from Home Science Tools about magnetism. The lesson may go beyond the scope of the TEKS which focuses on classifying materials as magnetic or not, but the lesson can be used as an extension or elaboration activity to further understanding of how magnets work.
 - 🍎🙌 [How Many? How Far? How Thick?](#) – In this lesson plan from the open-educational resource provider Utah Education Network, “Students will conduct three related investigations concerning magnetic attraction and the relative strength of magnets.” Includes a printable observation/data sheet for students to use.
 - 🍎🙌 [Relative Density](#) – Web page of density-related resources from Baylor College of Medicine’s *SuperSTAAR* website, including 💻 [Sink It](#), an activity “to develop students’ understanding of sinking and floating.” It includes a printable student sheet at the top left of the page.

Access this and other resources for free at openstax.org

- 🍎👏 [What Dissolves in Water?](#) – (Link to PDF version [here](#)) – This is another resource from BCM's educational outreach department, authored by Nancy Moreno, Ph.D., Barbara Tharp, M.S., and Judith Dresden, M.S. The investigation here highlights that some liquids and solids will dissolve in water and how substances dissolved in water are sometimes invisible.
- 🖥️ [Science Games for Kids: Circuits and Conductors](#) – This is a quick, interactive tool where students test different materials regarding electric conductivity and insulation. It requires Flash, so there might be some compatibility issues. The same organization has another game 🖥️ ([here](#)) that practices thermal insulation/conduction. These game websites both feature advertisements on the screen. [This website](#) 📖 provides some interesting background on conductors and insulators with helpful examples, but goes beyond the scope of the TEKS. 🍎👏 This [quick and easy hands-on activity](#) from the Utah Education Network also provides experience with insulators.
- (B) *Demonstrate that some mixtures maintain physical properties of their ingredients, such as iron filings and sand and sand and water.* (**Supporting**) [Released items](#)
 - 🍎👏 [Eat Iron?!!](#) – In this 30-minute hands-on activity, students use magnets to find tiny pieces of iron in iron-fortified breakfast cereal flakes in two ways. First, they try attracting a single flake in water, then they try using a magnet to separate the iron from the cereal in a cereal slurry. The iron in this heterogeneous mixture (cereal) retains its properties and can be separated by physical means of being attracted to a magnet. Excellent, detailed teacher instructions, comprehensive vocabulary descriptions, and connections to engineering processes that separate mixtures are provided. (Note: Although the activity is suggested for high school chemistry, this particular lesson from the University of Colorado at Boulder STEM engineering website is simple enough and appropriate for 5th grade.)
 - 🍎👏📖 [Mystery Package](#) – Students investigate the ingredients of a mystery package that was delivered to the university without a materials list. Students test the physical properties of each layer of the mixture, including color, texture, and changes in water. Afterward, they submit their conclusions to the university office about whether the ingredients were homogeneous or heterogeneous. The website is sponsored by the University of Texas at Austin's UTeach Outreach program for teachers. The lesson is based on the 4E learning model and has supporting documents, background information specific to grade level concepts, and detailed instructions with images. It is very thorough.
 - 🍎👏 [Separation of Sand, Iron, and Salt](#) – This investigation creates a heterogeneous mixture of three ingredients in which iron is separated out using a magnet, sand is separated out using a filter, and the salt is left behind as an evaporite after boiling the salty water. (Note: In this investigation, salt is called by its chemical compound name, *sodium chloride*. Also, a magnet, hot plate, filter paper, and evaporating dish are necessary equipment for this activity.)
 - 📖 [Laboratory Techniques for Separation of Mixtures](#) – Although this is a college-level chemistry website, the content is easy to understand and provides a clear explanation of four mixture separation techniques: evaporation, filtration, distillation, and chromatography. A simple quiz follows the content with answers available to the reader. The site is sponsored by the British Columbia Faculty Open Textbooks group.
 - 🎬 [Separating Mixtures and Properties](#) – This is a clever video on different methods that can be used in the classroom for separating a mixture. Although this was produced for a 3rd grade class, the content is very appropriate for a 5th grade class. (Note: The background song on the properties of matter being played throughout the video can be very distracting. Because descriptions are clearly written on the screen for each image, you can mute the song while watching the video. The song can even be heard as a separate activity.)

-  [Science Grade 5 Unit 2 Exemplar Lesson 2: Properties of Mixtures, Solutions, and Water](#) – This online reprint from Big Spring ISD is an eight-day teaching unit from C-Scope on mixtures and solutions with complete lesson plans from start to finish. It has detailed background material, vocabulary, a suggested script for teaching daily lessons, printable student handouts and teacher resources, suggested investigation materials and procedures, and discussion questions. This covers both TEKS 5.5B, and 5 5C.
- C) *Identify changes that can occur in the physical properties of the ingredients of solutions such as dissolving salt in water or adding lemon juice to water.* **(Supporting)** [Released items](#)
 -  [Solutions and Mixtures](#) – This Chem4Kids website clearly explains why some mixtures are heterogeneous, while others, called solutions, are homogeneous. Most students are familiar with the term *solution*, referring to a liquid dissolved in another liquid. This website introduces students to other solution combinations, such as gases dissolved in other gases, solids, or liquids; liquids dissolved in other liquids or solids; and solids that are dissolved in other solids. The website goes on to distinguish solutions that are homogeneous mixtures with small particles from colloids that are homogeneous mixtures with larger particles.
 -  [A Solution is a Type of Mixture](#) – This is a six-page pdf reprint for students from a New Jersey middle school science program in the Flemington-Raritan Regional School District. It contains great explanations of specific properties that change when solutions are formed. For example, lowering the freezing point when salt is added to ice for making ice cream, thawing an icy road, or raising the boiling point when antifreeze is added to water in vehicles' radiators. This pdf also includes suggested investigations. The six pages are formatted like a science textbook with vocabulary lists, margin notes, subtopics, bold-faced vocabulary words, and detailed explanations. It also includes a section on solvents, solutes, and solutions terminology. This reprint focuses on how the “solutes change the physical properties of a solvent. Therefore, a solution’s physical properties differ from the physical properties of the pure solvent. The amount of solute determines how much the physical properties of the solvent are changed.”
 -  [Science Grade 5 Unit 2 Exemplar Lesson 2: Properties of Mixtures, Solutions, and Water](#) – This online reprint from Big Spring ISD is an eight-day teaching unit from C-Scope on mixtures and solutions with complete lesson plans from start to finish. This reprint contains detailed background material, vocabulary, suggested script for teaching daily lessons, printable student handouts and teacher resources, suggested investigation materials and procedures, and discussion questions. It covers TEKS 5.5B, and 5 5C.
 -  [Changes in Matter: Physical and Chemical Changes](#) – This site from LibreTexts is sponsored by UC Davis and is an open-source text that helps students tell the difference between physical and chemical changes, such as a physical change occurring when a solution is made. The site also discusses how solutions can be separated back into their original substances using these physical properties, but chemical changes occur when new substances are formed when a chemical reaction takes place.
 -  [Introduction to Solutions](#) – Here is a series of eight YouTube videos on solutions. (Note: Commercial ads begin the first video on the burning money trick, so be sure to allow the advertisements to complete before showing to students. Be sure to emphasize the following comment from the website: “Solutes with ionic bonds, such as table salt (NaCl), separate into individual ions (Na⁺ and Cl⁻). Solutes with covalent bonds, such as glucose (H₆C₁₂O₆), separate into individual molecules. In either case, the individual ions or molecules spread apart and are surrounded by molecules of the solvent.”)
 -  [!!!UNBURNABLE MONEY TRICK!!! \(Chemistry of Solutions Demonstration\) Science Experiment](#) – (3:45) This video shows a short demonstration where a liquid is dissolved in another liquid (rubbing alcohol). A dollar bill is soaked in rubbing alcohol, then ignited. The flame burns off the alcohol, but leaves behind

the water, and does not burn the dollar bill. The dollar bill stays intact but is damp. The video does not, however, explain that rubbing alcohol is a covalent compound, which causes the flame to ignite and burn the separated alcohol molecules, but leaves behind the small amount of water coating the dollar bill.

-  [Dissolving Salt](#) – (0:47) This short animation demonstrates how salt crystals (ionic bonds) are dissolved into sodium ions and chloride ions when water is added.
-  [Solute and Solvent: Dissolving](#) (1:38) – This short student-made video with animation shows how sugar (covalent bonds) and water form a solution.
-  [Rate of Dissolving WRT Stirring](#) (1:03) – This short student-made video shows how stirring affects the rate of dissolving sugar in water.
-  [Rate of Dissolving WRT Surface Area](#) (1:03) – This short student-made video shows how surface area affects the rate of dissolving sugar in water. (Rock sugar cube has less surface area than a teaspoon of granulated sugar.)
-  [Rate of Dissolving WRT Temperature with Stirring](#) (1:37) – This student-made video shows how temperature affects the rate of dissolving sugar in water (cold vs. hot water).
-  [Soluble and Insoluble](#) (1:50) – This student-made video shows examples of materials that are soluble (can be dissolved) and insoluble (cannot be dissolved).
-  [Boiling Point Elevation and Freezing Point Depression: Chemistry, Khan Academy](#) (15 min) – This is a video lesson by Khan Academy on how the properties of matter, such as boiling point and freezing point, can change in solutions.

(6) Force, Motion, and Energy – The student knows that energy occurs in many forms and can be observed in cycles, patterns, and systems. The student is expected to do the following:

- (A) *Explore the uses of energy, including mechanical, light, thermal, electrical, and sound energy.*

(Readiness) Released items

-  [Exploring the Uses of Light, Thermal, Mechanical, Sound, and Electrical Energy](#) – This is a 104-page reprintable document that represents a comprehensive two-week lesson plan on energy designed specifically for science TEKS 5.6A by the Southwest Educational Laboratory (SEDL). Please note the instructions on page 2 show how teachers should give credit to SEDL when reprinting pages. This is an outstanding resource.
-  [Exploring Energy: What Is Energy? – Lesson 1](#) – One of three energy websites from the Teach Engineering STEM website for Grades 5–6 sponsored by the University of Colorado at Boulder. This is a one-hour introductory lesson into what energy is, different forms of kinetic and potential energy, and energy transfer. More detailed lessons follow this introductory one. This lesson includes a PowerPoint presentation and pre/post quizzes.
-  [Exploring Energy: Kinetic and Potential – Lesson 2](#) – One of three energy websites from the Teach Engineering STEM website for Grades 5–6 sponsored by the University of Colorado at Boulder. This one-hour lesson on kinetic and potential energy includes a PowerPoint presentation and pre/post quizzes.
-  [Exploring Energy: Energy Conversion – Lesson 3](#) – One of three energy websites from the Teach Engineering STEM website for Grades 5–6 sponsored by the University of Colorado at Boulder. This one-hour lesson on energy transfers that can take the form of force, electricity, light, heat and sound includes a PowerPoint presentation and pre/post quizzes.
-  [5.6A SW Explore the Uses of Energy, Including Mechanical, Light, Thermal, Electrical](#)

[and Sound Energy](#) – (Note: A commercial ad plays at the beginning of this slideshow on the uses of energy that should be played through before presenting to students. This downloadable slideshow is specific to Science TEK 5.6A. Because the narration is a monotone computerized voice, it is suggested to mute the sound and read the content aloud.)

-  [Energy Forms \(5th Grade\)](#) – This is an open-resource, well-developed lesson plan from Trinity University Digital Commons. This innovative nine-day energy unit is based on students being challenged to create energy uses on a fictitious planet. Several opportunities in the lesson connect children's literature stories directly with the science content, and it includes other supporting website links and video links. Cooperative group learning strategies, grading rubrics, and pre/post-assessments are included.
 -  [Energy Basics: Department of Energy – Scavenger Hunt](#) – (1 hour) In this activity, students complete a scavenger hunt worksheet from the US Department of Energy in order to learn about the basics of energy and its sources. For the complete six-day Energy Unit that includes this scavenger hunt, see the next resource.
 -  [NSTA - AHEEC Energy Unit Curriculum Guide: Elementary, Grades 3–5](#) – This comprehensive 32-page curriculum guide has five 60-minute lessons based on the US Department of Energy website designed especially for kids and teachers. This curriculum includes detailed instructions for an energy scavenger hunt, reprintable posters, real or virtual field trips, labs, worksheets, and assessments (with answer keys). Students “investigate energy and how it is produced, transmitted, conserved, and managed, evaluate their personal use of energy and develop a plan for conservation, analyze energy resources and empower their communities (home, school, and local) to adopt energy and money-saving practices, and engage in STEM activities with real-world applications for their daily behaviors.”
 -  [Play Power Up!](#) – This is a NASA computer game in which students try to produce enough energy to support a town using solar and wind energy. Students win awards in-game for using clean energy to power their town.
 -  [Exploring Light, Thermal \(Heat\), Mechanical, and Sound Energy in Everyday Life](#) – This comprehensive website on thermal, mechanical, and sound energy from Southwest Educational Development Laboratory (SED) also provides a link to a 75-page complete teaching unit on energy. The 5E lesson plan also has bilingual vocabulary support and detailed instructions on how to set up the four learning centers. Links to interactive games on the content also are included. (Note: Although this activity is labeled for 3rd grade, the content is very appropriate for 5th grade.)
- (B) *Demonstrate that the flow of electricity in closed circuits can produce light, heat, or sound.*
(Readiness) [Released items](#)
 -  [Play Power Up!](#) – This is a NASA computer game in which students try to produce enough energy to support a town using solar and wind energy. Students win in-game awards for using clean energy to power their town.
 -  [Circuit and Electricity Vocabulary Compiled by Nucleus Learning Network](#) – These 26 premade vocabulary cards compiled by the Nucleus Learning Network on circuits and electricity have definitions and suggested games to play with the cards.
 -  [Potato Power](#) – In this 45-minute hands-on activity, students make electrical circuits using potatoes to light an LED clock or light bulb. Students will learn how a battery works and how chemical energy is changed to electrical energy.
 -  [Build a Toy Workshop](#) – In this activity, students will use their knowledge of engineering design and electrical circuits to build a toy car which is sponsored by Teach Engineering, a STEM website for Grades 5–6 sponsored by the University of Colorado at Boulder. This comprehensive lesson plan includes PowerPoint and printed

- instructions, video content, detailed procedures, and suggested assessments.
-    [PBS Electric Circuits](#) – In these three 60-minute lessons, students act out a circuit, build, and then draw diagrams of electric circuits and test conductivity. This comprehensive lesson has several reference videos for students. Students have a choice of designing a door alarm, a steadiness tester, or a lemon battery.
 -    [Electric Circuits](#) – This Victoria, Australia teacher article, *Contrasting Student and Scientific Views*, offers important explanations of common misunderstandings students (and some teachers) have about electricity. Various conceptual models or analogies are described that can facilitate student learning, especially for concrete learners. In addition, the article includes several Predict-Observe-Explain student activities.
 -  [5.6B TEKS Slideshow on Electric Circuits](#) – This slideshow contains 24 slides on open and closed electric circuits and examples of how light and sound can be produced by an electric circuit. Links to other slideshows on electricity are offered on this page as well. (Note: Commercial ads appear, not in the slideshow, but in the website margins. The slideshow can be downloaded, which is an option for avoiding the commercial ads on this website.)
- (C) *Demonstrate that light travels in a straight line until it strikes an object and is reflected or travels through one medium to another and is refracted.* **(Readiness)** [Released items](#)
 -   [Optics for Kids: What is Light: Light Optics](#) – This site, sponsored by Bruce Irving from the Optical Solutions Group, offers clear explanations with many well-done graphic illustrations on topics including light, lens, lasers, and scientists and engineers who use light. It provides resources for teachers and parents.
 -   [Characteristics of Light: Light Travels in a Straight Line](#) – From Minnesota Science Teachers Education Project, this short lesson plan has students explore how to prove that light travels in a straight line using three cards, with a hole punched in each one, and a flashlight.
 -   [Light Digital Sampler: Lesson 3](#) – Sponsored by Chicago Educational Publishing Co, this is a free digital sample of one of 11 lessons on a unit on light from their Science Companion program. This lesson focuses on how light travels in a straight line and provides student activities and printable handouts. The concluding pages do advertise their complete program, but also provide links to other free sampler teacher materials.
 -   [Introduction to Light and Color](#) – Provided by NASA Optics, this is a printable educator's guide on light that is reflected (bounces back) in concave and convex mirrors, and on light that is refracted (bent) in lenses and magnifiers.
 -    [Light 1: Making Light of Science](#) – This AAAS ScienceLinks website covers three lessons on the nature of light; how light is either transmitted (passes through), reflected, refracted, or absorbed; the electromagnetic spectrum and the slinky model; and how the eye perceives color. The lessons also clear up the common misconception that students have that unshiny, opaque materials do not reflect light.
 -  [Understanding Absorption of Light: Why Do We See Different Colors?](#) (3:30) – This Edmund Scientific video explains why we see certain reflected colors while other colors are absorbed.
 -  [The Star Party: How Telescopes Work: Ways to Gather Light](#) – This Orion Telescope video shows how telescopes gather light from distant objects in the night sky with lenses that refract or mirrors that reflect. Refractors and reflectors are two major types of telescopes that use the characteristics of light to bend or bounce in order to gather light that is focused for our eye to see.
 -   [How Telescopes Form Images: Video and Lesson Transcript](#) – This video, sponsored by Study.com, explains how light is transmitted from distant objects into a

telescope and is either reflected (bounces back) or refracted (bent) to a focus point. Our eye perceives the light from distant objects because the telescope eyepiece enlarges the light gathered by the lens or mirrors and sends it to our eye to interpret. This lesson appears as both a video with illustrated graphics and as printed pages on the website.

- (D) *Design a simple experimental investigation that tests the effect of force on an object.*

(Supporting) (Note: the resources listed below are based on the study of forces acting at a distance such as gravitational, magnetic, electrostatic forces and those that are contact forces such mechanical, friction, and spring forces.) [Released items](#)

- 🍎👏📖 [NASA Rockets: Educator's Guide](#) – This 153-page downloadable teacher's guide is a comprehensive set of illustrated lessons plans and student materials covering the following:
 - The History of Rockets
 - New Era Spaceflight
 - Space Launch Systems
 - How Rockets Work
 - Newton's Laws of Motion
 - Rocket activities (16 rockets made with soda cans, paper rockets, water rockets, balloons rockets, foam rockets, air pressure launched rockets, etc.)
 - Altitude Tracker
 - Wind Tunnel Simulator
 - Final Team Challenge

Rocketry is one of those topics that lends itself to the study of forces and engages student learning and builds on their natural curiosity about spaceflight. This guide provides a great set of instruction materials from which the teacher can pick and choose those that work best for their students and classroom setting.

- 🍎👏📖 [Frictional Force in Hockey: The Puck Stops Here](#) – Students test various hockey puck materials to find which one creates the least amount of friction and slides the farthest. Kinetic, potential, and thermal energy are discussed including the fact that friction causes kinetic energy to transfer into thermal energy, which decreases kinetic energy along with a decrease in velocity. The equations for kinetic and potential energy are not required for this activity. This website provides background, detailed instructions for the activity, and assessment options.
- 🍎👏📖 [Fifth Grade Lesson: Weight, Mass, and Gravity](#) – This is an inquiry-based lesson from BetterLesson. Teachers only need to create an account with an email address to access free lesson plans and videos with comprehensive instructions. Many audio-visual resources are also available. In this lesson, students explore why an astronaut can jump higher on the Moon than on Earth and discover the relationship between weight, mass, and gravity. The lesson is based on the Focus-Explore-Reflect-Apply learning sequence.
- 🍎📖 [Force and Motion Unit from Broward School in Florida](#) – This 16-day lesson plan (40 pages) on force and motion focuses on the three major forces: gravity, friction, and magnetism. Although the teacher's guide makes reference to particular textbooks and videos, the student activities can be done without them. Suggested questions are included.
- 🍎📖 [Fifth Grade Lesson: The Push and Pull of Magnets](#) – This lesson on magnetism is sponsored by the BetterLesson website to help students visualize the magnetic field that surrounds a magnet. Students test magnets of various sizes to determine if larger magnets have stronger magnetic fields. This lesson has several components that build a strong learning and discovery experience.
- 📖 [Teacher's Guide, Grade 5: Effects of Force](#) – Sponsored by Edusmart, this concise three-page teacher's guide targets major misconceptions about force and provides

background for students to understand the difference between mass and weight. Five important questions (with answers) are provided for focusing student discussions.

-  [Forces and Motion](#) – Produced by the seven-state Appalachian Electric Cooperative, this is a comprehensive 10-page unit on force and motion. Students will understand and describe types of forces, including gravitational force and frictional force. The unit includes introductory video, content background material with illustrations, assessments, guided practice links, games, activities, articles, independent activities and a worksheet with answers.
-  [Take Charge! All About Static Electricity](#) – Offered by Teach Engineering, a STEM website for Grades 5–6 sponsored by the University of Colorado at Boulder. Students will induce an electrical charge on various objects, and experiment with electrical repulsion and attraction. The lesson includes detailed background information with illustrations, videos, assessments, and extension activities. This is one of six lessons on electricity found on this site.

(7) Earth and Space – The student knows Earth's surface is constantly changing and consists of useful resources. The student is expected to do the following:

- (A) *Explore the processes that led to the formation of sedimentary rocks and fossil fuels.*

(Readiness) Released items

-  [Sedimentary Rocks: Pictures, Characteristics, Textures, and Types](#) – This website from Geology.com offers detailed pictures of different types of sedimentary rocks and information about their formation. Each rock links the reader to more pictures and detailed information on that particular rock.
-  [Sedimentary Rocks](#) – These GeoScience videos on sedimentary rocks explain how to classify the three major types of sedimentary rocks (clastic, chemical, biochemical) and give examples of each.
-  [Fossil Fuels: The Dirty Facts](#) – This website is sponsored by the National Resources Defense Council, an international group promoting the use of clean resources. This site explains in great detail how fossil fuels (coal, oil, natural gas) have formed and how their use can lead to pollution and degradation of the planet.
-  [Natural Gas Explained](#) – This website from the US Energy Information Administration (EIA) explains how the fossil fuel, natural gas, was formed from the burial of ancient marine plants and animals and how natural gas is used. This site also provides links to related content.
-  [Coal Explained](#) – This website from the US Energy Information Administration (EIA) explains how the fossil fuel, coal, was formed from the burial of plant life in ancient swamps.
-  [Oil and Petroleum Products Explained](#) – This website from the US Energy Information Administration (EIA) explains how petroleum and oil were formed from ancient marine plants and animals. This site provides links to related content and data sources.
-  [Petroleum Oil: A Fossil Fuel](#) – This website from the US Energy Information Administration (EIA) is designed specifically for kids and focuses on the formation and use of petroleum oil. This is a comprehensive website with many links to supporting material, detailed information, and illustrations.
-  [What Are Fossil Fuels? National Geographic](#) – This is a short video from National Geographic on how fossil fuels are formed.
-  [Fossil Fuel Formation Complete](#) – This nine-minute video from Hello Science explains how fossil fuels were formed. Computer graphics illustrate the content.

- 🍎👏📖📍 [Will It Last?](#) – This 10-page, 5th grade teacher's guide from the University of Florida covers renewable and nonrenewable (fossil fuel) resources. The four activities include hands-on investigations, simulations, and games. Students will discover which resources will last (renewable) and why other resources do not last (nonrenewable).
- (B) *Recognize how landforms such as deltas, canyons, and sand dunes are the result of changes to Earth's surface by wind, water, or ice.* **(Readiness)** [Released items](#)
 - 🍎📖 [Weathering and Erosion](#) – From the mrsciguy.com website sponsored by science teacher Phil Medina, this is a comprehensive guide to the agents of weathering and erosion with many illustrations to support the content. This website provides detailed background for understanding how wind, water, and ice change Earth's surface.
 - 📖 [10\(a\) Landforms of Glaciation](#) – This website from physicalgeography.net explains, in great detail and with many illustrations, how ice has transformed the surface of Earth.
 - 🍎👏📖📽️ [Ohio's Teacher's Guide to Landforms Unit](#) – This four-week comprehensive lesson plan from Ohio is labeled for 4th grade, but applies directly to the 5th grade Texas TEK on landforms. This is an excellent source for background material, student worksheets, hands-on investigations, assessments, and videos.
 - 📽️ [Earth's Surface Feature](#) – From Garrard, Kentucky schools, this is a PowerPoint presentation on constructive and destructive forces that shape Earth's surface. Links to other, more detailed content on weathering and erosion are shown as underlined key words in the PowerPoint.
 - 📖 [Biosphere: Weathering](#) – This Geography4Kids website offers content background on types of mechanical, chemical, and biological weathering. Written in a kid-friendly style, this website offers a simple explanation that describes the difference between types of weathering and the resulting landforms the process creates.
 - 📖📽️ [Deltas | Rivers | Earth Processes: OneGeology Kids eXtra](#) – From the OneGeology organization, this website explains how different deltas form in kid-friendly wording with interactive graphics. Key vocabulary words are underlined and linked to another webpage, offering more detailed explanations.
 - 🍎👏📖📽️ [Geology Program Zion Distance Learning](#) – This unique program offered by the National Park Service on the geologic formation of Zion Canyon in Utah is specifically for classes with the ability to connect to their park's distance learning program on the internet. Students will have the opportunity to interact with a park ranger as they remotely explore and discover the formation of the narrow slot canyon in Zion National Park. The website has a pre-registration link and details of the process.
 - 🍎👏📖📽️ [Middle School Online Activities – Curriculum Guide and Online Activities: Great Sand Dunes National Park and Preserve](#) – This National Geographic site offers a Great Sand Dunes online curriculum of five activities with a reprintable teacher's guide. There are three main components to the middle school section:
 - Each activity uses applied science and real data. A researcher profile introduces students to one of the scientists who collected data upon which the activity is based.
 - In solving the puzzles, students engage in active problem solving, similar to using the scientific method.
 - Additional off-computer activities or critical thinking questions are marked by an apple icon for reinforcing learning.

(8) Earth and Space – The student knows that there are recognizable patterns in the natural world and among the Sun, Earth, and Moon system. The student is expected to do the following:

Access this and other resources for free at openstax.org

- (A) *Differentiate between weather and climate.* **(Supporting)** [Released items](#)
 - 📖 [What's the Difference Between Weather and Climate? | News](#) – This is an excellent summary with graphic illustrations and charts by the National Centers for Environmental Education on the difference between weather (daily atmospheric conditions) and climate (long term trends). Teachers or students can click on any of the many bold-faced vocabulary words/phrases to be linked to other websites that have more detailed information and pictures on that vocabulary word or phrase
 - 📖 🎬 [What's the Difference Between Weather and Climate?](#) – From NASA's Climate Kids website, this video and poster explain the difference between weather and climate, using kid-friendly wording and images. The video also has a transcript appearing on the website.
 - 🍎 🙌 📖 🎬 [Climate vs. Weather](#) – From Florida's CPalm curriculum resources, this website offers activities and three videos to help students discover the difference between weather and climate.
 - 📖 🎬 [Climate vs. Weather: Difference and Comparison](#) – This Diffen website explains the difference between long term climate conditions and temporary, daily weather conditions of the atmosphere. A video on the differences is included.
 - 🍎 🙌 📖 🎬 [Lesson 8: It's All in the Name](#) – This National Wildlife Foundation 5E lesson format (Engage, Explore, Explain, Elaborate, and Evaluate) introduces students to the difference between weather and climate over a two-day sequence of activities and interactions. (Note: Access to the internet is needed for these experiences.)

- (B) *Explain how the Sun and the ocean interact in the water cycle.* **(Supporting)** [Released items](#)
 - 🍎 🙌 📖 🎬 [Water Cycle Video For Kids: 3rd, 4th and 5th Grade](#) – This Generation Genius commercial website offers a free trial. Teachers can access the comprehensive lesson guide and video on the water cycle for free.
 - 🎬 [The Water Cycle \(video\) | Ecology](#) – This video from the Khan Academy provides an excellent explanation and graphic illustrations of the water cycle and the important role the ocean plays in that cycle. (Note: If this video is intended for student viewing, a large projection screen would be necessary in order for students to see the detailed drawings and notes written during the explanation.)
 - 📖 [The Water Cycle for Schools and Students](#) – The USGS (US Geological Survey) offers a unique poster that is provided on three levels: beginners, intermediate, and advanced. Each level has an image of the water cycle with key words superimposed on the poster. If the user's mouse hovers over a particular word, a detailed pop-up definition appears. The advanced levels have more difficult vocabulary words than the lower levels.
 - 🎬 [The Water Cycle](#) (2:42) – This video by the NOAA (National Oceanic and Atmospheric Administration) on the water cycle is designed to provide a basic understanding of the water cycle, especially for students who need simplification of the concept.
 - 🍎 🙌 📖 [5th Grade, Lesson 1.4: The Water Cycle](#) – Sponsored by the American Chemical Society, this lesson has students create a water cycle model of the process of evaporation, condensation, and precipitation. (Note: Students will need access to water, ice, and lab materials listed in the lesson guide.)
 - 🍎 🙌 📖 [Water Cycle Teachers Page](#) – This is the state of Washington's comprehensive, two-week lesson plan guide for teachers on five activities on the water cycle (condensation, evaporation, precipitation, runoff, and the whole water cycle). Resources include a "Water Boogie" song for students, assessments, and very detailed activity instructions for teachers to follow.

- (C) *Demonstrate that Earth rotates on its axis once approximately every 24 hours causing the day/night cycle and the apparent movement of the Sun across the sky.* **(Readiness)** [Released items](#)
 -  [The Earth's Rotation](#) – This Windows to the Universe website sponsored by the National Science Teachers Association explains the spinning of Earth's axis, causing day and night as we face, then turn away from, the Sun. (Note: This site has three instructional options along the top menu that can be selected to enhance student learning: Beginner, Intermediate, and Advanced.)
 -  [Day 1: The Passing of Time: Day/Night, Seasons, and Years](#) – This is an outstanding hands-on lesson where students model Earth's rotation facing a “sun” to experience the day and night cycle, and the apparent movement of the Sun, Moon, and stars across the sky, emphasizing that the apparent movement of the Sun and stars across the sky is an optical illusion created by a rotating Earth. In addition, students will model the revolutionary orbit of Earth around the Sun at a 23.5-degree angle to model the changing seasons for the northern and southern hemispheres.
 -  [Lesson: The Sun, Earth, and Moon Relationship](#) – Using the 5E instructions on this BetterLesson website, students will create a model illustrating the movement of Earth and Moon in relation to the Sun to write an evidence-based explanation for why they see the Sun and stars seem to move across the sky. The lesson includes video, student interactions, hands-on investigations and discussions that lead to the discovery of key concepts on the interaction among the Sun, Earth, and Moon.
 -  [Astronomy Unit Grade 5](#) – This is a comprehensive astronomy unit rich in content, videos, activities, and pedagogy, prepared by Carolyn Colley from University of Washington. (Note: For relevance to this TEK only, use only lessons 1, 2, 9, and 10 for an eight-day unit on this TEK.) Use Lesson 1 to elicit student ideas about the day-and-night cycle and the apparent movement of the Sun across the sky. Lesson 2 connects a model of the day-and-night cycle with student understanding of the phenomena caused by Earth's rotation. Use Lesson 9 to revise models and Lesson 10 to provide evidence-based explanations. The strength of this lesson plan is the unique approach to student learning guided through clearly defined teacher practices and scaffolding student thinking. Each strategy is explained in detail. This teaching unit is noteworthy due to the inclusion of detailed explanations of instructional strategies aimed at constantly revising and re-applying student thinking to real phenomena.
 -  [Spinning Day and Night: Activities](#) – From the United Kingdom, this activity is a simple approach to modeling day and night and offers the teacher a suggested dialogue to engage students in this discovery process.
 -  [Apparent Movement of the Sun](#) – Science teacher, Mr. Henry, does a clever demonstration using a cell phone to show why the Sun appears to move across the sky, but really isn't moving, due to Earth's rotation. A great feature of this video is the time that teachers can take for students to discuss the phenomena and come up with their own reasons why the Sun appeared to move when, in fact, the teacher wasn't moving the picture of the Sun.
- (D) *Identify and compare the physical characteristics of the Sun, Earth, and Moon.* **(Supporting)** [Released items](#)
 -  [In Depth: Sun](#) – This NASA Solar System Exploration website offers comprehensive information on our star, the Sun—its size, distance, orbit, rotation, formation, structure, surface, and atmosphere, along with a detailed poster and videos.

-   [In Depth: Earth's Moon](#) – This NASA Solar System Exploration website offers detailed information on our Moon—its size, distance, formation, structure, surface, water, atmosphere, and magnetosphere. Two videos are available on the structure of the moon and the Apollo moon landings.
-   [In Depth: Earth](#) – This NASA Solar System Exploration website offers videos and detailed information on Earth—its size, distance, orbit, rotation, structure, surface, atmosphere, magnetosphere, the Moon, and life.
-   [Lesson Plan: How Big is the Sun?](#) – This hands-on lesson from Eye on the Sky has students make huge models of the Sun, Earth, and Moon to compare size and scale (It would take four moons to span the diameter of Earth and 109 Earths to span the diameter of the Sun.) Although the grade level is listed as 1–3, the hands-on model portion is also good for 5th grade.
-  [Science: The Earth Moon Sun System](#) – Exceptionally well-done video explanation of the size-distance relationship of the Earth-Moon-Sun system by science teacher Derek Owens. Hand-drawn graphics are created as he explains each comparison. An impressive moment in the video occurs when the distance between a small circle on the left of the screen, which represents the Sun has an arrow running from the Sun to the right side of the screen where Earth is 93 million miles. Earth is so small in comparison, that you can't see the dot, but when the teacher zooms into the head of the arrow, then you can see this tiny, tiny dot that is Earth.
-   [Modeling the Earth-Moon System](#) – This clever hands-on comparison of the Earth-Moon-Sun system uses assorted playground balls and smaller round objects, such as marbles, for students to discover the relationship between size and scale for these three celestial objects. Complete instructions are given to help the students work through the discovery process.
-  [5th Grade Earth, Sun, and Moon Song](#) – This video is a song by 5th grade teacher Katie Houstle and sung by her entire 5th grade class. Clever lyrics and hand motions help students remember the characteristics of the Sun, the Moon, and Earth. One student having trouble following the group who is in the background may be a distraction, but the song is still engaging enough.

(9) Organisms and Environments – The student knows that there are relationships, systems, and cycles within environments. The student is expected to do the following:

- (A) *Observe the way organisms live and survive in their ecosystem by interacting with the living and nonliving components.* **(Readiness)** [Released items](#)
 -  [Biomes of the World](#) – Biomes of the World provides information on rainforest, tundra, taiga, desert, temperate, and grassland biomes. For each of these, information is provided about the climate, plants, and animals found there and which are the living and nonliving parts of those ecosystems.
 -  [Living Things in Ecosystem](#) – This is a great website for an introduction to the living and nonliving components in an ecosystem. This link focuses on the plants and animals that live in an ecosystem. On this same website are links to the nonliving components and also links to each of the major biomes. The simple explanations and many illustrations lend themselves to a class presentation using a projector.
 -   [Ecosystem Relationships: Lesson Plan](#) – In this 5E lesson plan and videos, students learn how biotic and abiotic factors affect organisms in an ecosystem and describe the different types of relationships that occur between organisms in an ecosystem, with emphasis on the predator-prey relationship. Has videos, links, and other resources to support the lesson plan on ecosystem relationships.
 -     [Living \(Biotic\) and Nonliving \(Abiotic\): Parts that Make Up an Ecosystem](#) –

This BetterLesson website offers a comprehensive 5E lesson plan on parts of an ecosystem written by Massachusetts science teacher Carrie Boyden. 5th grade students are introduced to the vocabulary words biotic (living) and abiotic (nonliving) as components in an ecosystem. How plants and animals interact with each other and their ecosystem is the subject of this lesson.

-  [Introduction to the Characteristics of life](#) – This stunning video is an introduction to the diversity of life and which characteristics are necessary for life. The music perfectly reflects the majesty and awe-inspiring scenes captured on film.
 -  [Ecosystems](#) – Animated video on ecosystems by Study Jams created by Scholastic. Inc. Suggestion: download the pdf available on this page that has a summary of the video. Other video links related to ecosystems are also available on the site.
 -     [Activities to Teach Living Things](#) – This teacher website by Reagan Tunstall has a unique approach to teaching living things with activities such as: a hands-on picture museum walk, shared writing, book suggestions, 10 interactive science activities, flipbook, shutter fold books, and investigating gummy worms vs. real earthworms and teddy bears vs. real bears.
- (B) *Describe the flow of energy within a food web, including the roles of the Sun, producers, consumers, and decomposers.* **(Readiness)** [Released items](#)
-     [Food Webs](#) – From BioEd Online, Science Teacher Resources from the Baylor College of Medicine, this comprehensive lesson plan features detailed instructions, reprints, slides and resource material. Students construct food webs for six different ecosystems. They discover the relationships among producers, consumers, herbivores, carnivores and decomposers. Student reprintable sheets are provided in English and in Spanish. The activity is from *The Science of Food Teacher's Guide*.
 -   [Energy Flow in Communities](#) – This is a comprehensive video from Anneberg Learning about the flow of energy in communities where food webs made up of producers, consumers, and decomposers transfer energy from the Sun through the organisms in a food web. The hour-long video is high quality and focuses on the following three goals for students:
 - Distinguishing between energy and matter as they relate to the living world
 - Distinguishing between producers, consumers, and decomposers with regard to energy flow in a community
 - Describing what happens to energy as it moves through a community
 (Note: Although the video is intended for teacher education, the content is applicable for students in 5th grade working on energy flow in food webs. You may want to fast forward during the parts specifically for teachers.)
 -      [Producers, Consumers, Decomposers, and Energy Transfer](#) – This lesson plan from the state of Florida on producers, consumers, and decomposers includes a 22-slide PowerPoint with a detailed teacher's guide to guide student discussion. Includes guided practice, independent practice, closure activities, and assessments.
 -  [Biosphere: Food Chains](#) – From Geography4Kids.com, this short website offers a concise, kid-friendly introductory summary of the role of producers, consumers, and decomposers in an ecosystem.
 -  [Understanding Ecosystems for Kids: Producers, Consumers, and Decomposers](#) (6:22) – This engaging video on the role of producers, consumers, and decomposers in ecosystems was produced by Free School. A wide variety of ecosystems are visited.
 -  [Producers, Consumers, and Decomposers](#) – This suggested lesson plan from Eleducation, a commercial group that sells their lesson plans, has links they provide to two videos can be used in your classroom on Food Chains and Food webs.

-  [Producers and Consumers](#) – This is a 10-page pdf from Buncombe schools, North Carolina, that is an excellent summary of ecosystem topics with clever graphics. This pdf is kid-friendly and suitable for posters or PowerPoint images. Could also be used as a great study review guide or as introductory documents.
- (C) *Predict the effects of changes in ecosystems caused by living organisms, including humans, such as the overpopulation of grazers or the building of highways.* [\(Supporting\) Released items](#)
 -   [Oh Deer! Game Directions](#) – Oh Deer! Is an ecology game from Beacon Learning Center. Students graph population change over time according to habitat availability. After playing the game, they will be able to predict the effects of changes due to overpopulation of the habitat by deer and other organisms.
 -     [Can Nutrients in Water Cause Harm?](#) – From Science Teachers Resources Baylor College of Medicine -Bio Ed Online, this comprehensive lesson plan focuses on the following three topics:
 - Different kinds of organisms live in water.
 - Excess nutrients will cause over-abundant growth of some organisms living in water.
 - Nonpoint source pollution is a major threat to water supplies in the United States.
 -   [The Lesson of the Kaibab](#) – From the Biology Corner, this lesson has students graph the fluctuating population of deer on the Kaibab Plateau at the Grand Canyon in Arizona. Human intervention in changing hunting and grazing policies backfired the original attempt to stabilize deer populations and, instead, allowed the deer population to grow out of control, resulting in the death of a huge number of deer.
 -  [Science 5.9 C: Changes To An Ecosystem](#) – This PowerPoint presentation from TES.com is on changes to an ecosystem from overgrazing, building highways, logging, building homes, and habitat destruction. Each slide has multiple bulleted points that are added one by one as you click the spacebar.
 -   [Ecosystem Change](#) – This website from Greenfacts.org focuses on ecosystem change. The welfare of life on Earth is highly dependent on ecosystems and the benefits they provide such as food and drinkable water. Over the past 50 years, however, humans have impacted their environment. To better understand the consequences of current changes to ecosystems and to evaluate solutions for the future, UN Secretary General Kofi Annan launched a comprehensive scientific study, the Millennium Ecosystem Assessment. This website provides a summary of that study written in a style easy to follow with topics, subtopics, and key questions with answers. The site also offers 10 videos on ecosystem and conservation issues that are accessible from their menu on the top banner.
 -    [Experiment with Ecosystems](#) – This website experiment is part of the Concord Consortium's Evolution Readiness project and requires the downloading of a JAVA software launcher. The experiment presents a screen where students can add variables and test their hypothesis if the inclusion or exclusion of grass, rabbits, hawks, and foxes affects the populations outcomes. They have the ability to reset those variables and test new hypotheses. A live graphic display tracks the changes in the ecosystem components as they fluctuate or stay the same. This is a clever way to show the steps of the scientific method while at the same time allow students to manipulate the variables and test hypotheses in a short period of time.
 -  [Human Impacts on Biodiversity | Ecology and Environment | Biology | FuseSchool](#) (4:28) – This video from Fuse School shows how humans are negatively impacting

biodiversity. Teachers can pause the video where key points are listed for note-taking or discussion.

- 🙌📖🎬 [Human Activities Affect Environment: 5th Grade Science Standards](#) – In this activity from the Internet4Kids website, students create a poster to illustrate how human activities and natural disasters affect the environment using the nine internet links provided on the website to a variety of resources that include videos, articles, and summarized data.
- (D) *Identify fossils as evidence of past living organisms and the nature of the environments at the time using models.* **(Supporting)** [Released items](#)
 - 🎬 [GCSE Science Biology \(9-1\) Evidence for Evolution: Fossils](#) – This video from Freesciencelesson.com is part of a series of middle school and secondary lessons from British science teacher Shaun Donnelly. Known for his succinct style and clear explanations, he explains the evidence for evolution found in the fossil record. Teachers might want to pause the video when listed summaries appear for note-taking or discussion. (Note: The student workbooks that accompany the video lesson are not free.)
 - 🙌📖 [Fun Fossil Facts for Kids: Fossils, Dinosaurs, Paleontology, and Petrification](#) – This is a brief introduction to fossil formation and the science of paleontology, sponsored by ScienceKids, a New Zealand website for free science resources. Click on these links from the same site for detailed instructions on:
 - How to make a cast fossil – [Make a Fossil Cast: Fun Science Fair Projects for Kids](#)
 - Picture of dinosaur poop – [Dinosaur Poop, Fossils, and Bones: Pictures, Photos and Facts](#)
 - Information on the large, carnivorous dinosaur called allosaurus – [Allosaurus Facts for Kids: Interesting Dinosaur Information](#)
 - Image of the *Sinornithosaurus* fossil, an early Cretaceous dinosaur – [Sinornithosaurus Fossils and Bones: Dinosaur Pictures, Photos, and Facts](#)
 - Information on the velociraptor, the famous dinosaur from the movie Jurassic Park – [Velociraptor Facts for Kids: Interesting Dinosaur Information](#)
 - Images of dinosaur eggs – [Dinosaur Eggs, Fossils, and Bones: Pictures, Photos and Facts](#)
 - 🎬 [Fossil and Their Formation \(video\)](#) – In this video from the Khan Academy, a clear description of how fossils form and a detailed explanation of the actual process of permineralization where bone tissue buried in sediments is replaced with minerals is presented.
 - 📖👁️ [BIO Evolution: Change Over Time–Evidence of Evolution](#) – This lesson on the evidence for evolution from Learning.elucidat.com includes an introductory “Explore” section with a detailed slideshow on the topic, followed by an interactive “Challenge Quiz”, and a final summary of key points
 - 🍎🙌📖 [The Fossil Evidence](#) – This is a comprehensive lesson plan from PBS on the fossil record, one form of evidence for evolution (two to three class periods suggested). The site is rich in resources with four videos and five supportive documents for downloading or printing. The two goals for students to learn are as follows: 1) learning how scientists use fossil evidence to trace the evolution of various species and 2) understanding methods used to date fossils.

(10) Organisms and Environments – The student knows that organisms have structures and behaviors that help them survive within their environments. The student is expected to do the following:

- (A) *Compare the structures and functions of different species that help them live and survive in a*

specific environment, such as hooves on prairie animals or webbed feet in aquatic animals.

(Readiness) [Released items](#)

-  [Animals Inherited Traits \(what are animals born with\) and Adaptations \(that help them survive\)](#) – This is a narrated slide presentation with many examples of structures and functions animals have for surviving in their environment, such as – camel, elephant, porcupine, chipmunk, opossum, beaver, and polar bear. Also included are distinctions between inherited traits which animals are born with and learned behavior which animals acquire after birth. A transcript of the narration is available below the slide player. The narration is done by a computerized, female, British voice which is easy to follow.
 -  [5.10A \(R\): Science](#) – This website has a large selection of reprints of illustrated adaptations of birds, mammals, plants, and reptiles. Also included are PowerPoints, videos and seven links, specifically on adaptation lessons on the internet.
 -  [Top 10 Animal Adaptations](#) – This is a slideshow, produced by Animal Planet, with written captions on the top 10 animal adaptations. This contains examples of how animals have adapted to their environment through inherited traits or through behavior that allows them to survive and be successful in their particular environment.
 -  [Plant Adaptations](#) – This slideshow produced by Scholastic, with written captions on plant adaptation, contains examples of how plants have inherited certain traits that allow them to survive in a particular habitat, meet their needs, and prevent predators from eating them.
 -  [Animal Adaptations](#) – This slideshow, produced by Scholastic, with written captions on animal adaptations, has examples of how animals have inherited certain traits or learned behavior that allow them to survive in a particular habitat, meet their needs, and prevent predators from eating them.
 -  [25 INCREDIBLE Camouflaged Animals](#) – This is a narrated slideshow video presentation on 25 of the most amazing animals that have adapted to their environment through structures that camouflage (hide) them from predators.
 -  [Fifth Grade Lesson Biosphere: Adaptations of Plants and Animals](#) – In this comprehensive lesson plan from BetterLesson, written by Florida science teacher, Jennifer Sallas, students will rotate through adaptation learning stations to investigate adaptations such as blubber, beaks, camouflage, unique plant parts, and behavior adaptations vs. physical adaptations. The lesson includes an introductory video, instructions for each adaptation learning center, guided practice, and a review with answers.
- *(B) Differentiate between inherited traits of plants and animals such as spines on a cactus or shape of a beak and learned behaviors such as an animal learning tricks or a child riding a bicycle.* **(Readiness)** [Released items](#)
 -  [Fifth Grade Lesson Biosphere: Adaptations of Plants and Animals](#) – In this comprehensive lesson plan from Better Lesson, written by Florida science teacher, Jennifer Sallas, students will rotate through adaptation learning stations to investigate adaptations such as blubber, beaks, camouflage, unique plant parts, and behavior adaptations vs. physical adaptations. The lesson includes an introductory video, instructions for each adaptation learning center, guided practice, and a review with answers.
 -  [Animal Adaptations](#) – In this slideshow, produced by Scholastic, with written captions on animal adaptations, are examples of how animals have inherited certain traits or learned behavior that allow them to survive in a particular habitat, meet their needs, and

- prevent predators from eating them.
- 👁️👁️ [Inherited Traits and Learned Behaviors](#) – This is a slideshow produced by Peach County Schools, Georgia, on examples of how living things have adapted to their environment through physical characteristics they have inherited and by doing certain things they have learned that helps them survive (some are by instinct and others have to be taught).
 - 🍎👏📖🎮 [Learned Traits vs. Inherited Traits](#) – This is a clever classroom game produced by the Utah Education Network, on the difference between learned and inherited traits with complete instructions, game cards, and lesson plan included. (Note: prior to the game, students will need a basic knowledge of what a genetic trait means, and that gene traits are passed on from parent to offspring. The teacher will need to cut out the playing cards in advance. Each student picks four inherited traits that they will have for the whole game and one learned behavior card and writes that under situation 1. The teacher reads to the class situation 1 and the students look at their traits and decide whether or not that the traits that they have would have allowed them to survive that situation. After all of the situations have been completed, the class will then compile the data that they have collected. Have the students create fractions and percentages for how many students survived each of the situations. The students then graph the class wide data on their chart.)
 - 🍎👏📖 [Science Vocabulary Ideas: Collaborative Anchor Charts for Inherited Traits and Learned Behaviors](#) – In this lesson plan from Ari Mosquera, an Austin, Texas science teacher, students make a collaborative anchor chart about inherited traits and learned behaviors. The teacher hangs eight cards with a photo and description of either an inherited trait or learned behavior around the room (examples given). The teacher will set up the template for the anchor chart, print and place a photo of each organism taped to a sticky note and a lined sticky note at each seat, then students select one of the photos based on where they chose to sit that day. Some of the review-focus vocabulary terms include *organism*, *instinct*, *inherited trait*, *learned behavior*, *offspring*, and *species*. Pairs of students walk around to all eight cards and discuss whether the characteristic described is inherited or learned and why. Then, the class will go over the cards as a whole group and place their sticky notes on the T-chart and present their card.

(end 5th grade)

4th Grade Science TEKS – [Supporting Only](#)

(7) Earth and Space – The students know that Earth consists of useful resources and its surface is constantly changing. The student is expected to do the following:

- (A) *Examine properties of soils, including color and texture, capacity to retain water, and ability to support the growth of plants.*
 - 🍎👉📖🎬 [TEKS-Based Lesson Plan on Soil Properties](#) – Use this video link from Region 3 ESC with the pdf lesson on properties of soil: [Elements of Earth Science: Rocks, Minerals, and Soils](#). Focus exactly on this TEK.
 - 🍎👉📖🎬 [Soil Properties](#) – This comprehensive lesson from Alabama schools requires students to investigate the capacity of different soils to retain water and to categorize the types of plants that will grow in different compositions of soil through the use of inquiry, technology, and reading skills. This lesson was created as part of a NASA STEM Standards of Practice Project, a collaboration between the Alabama State Department of Education and NASA Marshall Space Flight Center.
 - 🍎📖 [Soils and Plant Nutrients](#) – This is the North Carolina Extension Service comprehensive handbook on soil. It provides a very complete description of soil science concepts for the teacher. Great reference material.
- (C) *Identify and classify Earth's renewable resources, including air, plants, water, and animals, and nonrenewable resources, including coal, oil, and natural gas, and the importance of conservation.*
 - 📖 [Renewable and Nonrenewable Resources](#) – Provided by Penn State, this is a summary of the difference between renewable and nonrenewable resources written in kid-friendly language and with large example pictures suitable for classroom projection.
 - 📖 [Houston ISD pdf Reprint of Chapter on Natural Resources](#) – This is a colorful, well-done science textbook summary on natural resources.
 - 🍎👉📖🎬 [Fifth Grade Lesson Renewable and Nonrenewable Resources](#) – From BetterLesson and Florida science teacher Jennifer Sallas, this comprehensive lesson on natural resources includes warm-up, videos, guided practice, explore activities, handouts, and exit-ticket assessments. The lesson also includes the goal for students to identify advantages and disadvantages of both.
 - 🍎👉📖🎬 [Renewable Energy Lesson](#) – From the Teach Engineering STEM Curriculum at University of Colorado at Boulder, this is a comprehensive lesson plan where “students are introduced to the five types of renewable energy resources by engaging in various activities to help them understand the transformation of energy (solar, water and wind) into electricity. Students explore the different roles engineers who work in renewable energy fields have in creating a sustainable environment—an environment that contributes to greater health, happiness and safety.”

(8) Earth and Space – The student knows that there are recognizable patterns in the natural world and among the Sun, Earth, and Moon system. The student is expected to do the following:

- (A) *measure, record, and predict changes in weather.*
 - 🍎👏📖🎬 [Weather Forecasting: How Predictable! Activity](#) – From the Teach Engineering STEM Curriculum at University of Colorado at Boulder this is a comprehensive lesson on weather forecasting. Students follow weather forecasts to gauge their accuracy and produce a weather report for the class. They develop skills of observation, recording and reporting. (Note: To be the most effective, the website recommends that the teacher videotape one or more evening weathercasts and view in class, discussing how the weather is presented, identifying segments of the broadcast, noting the use of maps and symbols, discussing the meaning of weather symbols and basic terminology used by the meteorologist and critiquing the style of presentation. The objective is to prepare the students to produce their own weathercast.)
 - 🍎👏📖👁️ [10 Investigations Using Weather Instruments](#) – From Weather Wiz Kids, this website has 10 links to specific weather-related investigations using different weather instruments. The same organization has a great webpage with large images and descriptions of weather instruments that is a great companion to this website. The link follows here: [Weather Instruments](#).
- (B) *Describe and illustrate the continuous movement of water above and on the surface of Earth through the water cycle and explain the role of the Sun as a major source of energy in this process.*
 - 📖 [The Water Cycle for Schools and Students](#) – This interactive website from the USGS has over 20 interactive links buried in a single image on the water cycle. When students hover their mouse over one of those interactive panels, a detailed pop-up appears with more information and a graphic image.
 - 🍎👏📖🎬 [Water Cycle](#) – This NOAA website has comprehensive information on the water cycle and offers links to four classroom activities, five videos, and informative graphics.
 - 🎬 [Blue Planet](#) – This seven-minute video is an overview of how water shapes our planet and our lives. Using NOAA and NASA data, the movie presents water as the driver of Earth's dynamic systems, the source of all life on the planet.
 - 📖 [Hydrosphere and the Water Cycle](#) – This is a brief summary of the water cycle from the University of California at Berkeley. (Note: The hydrosphere is the entire body of water on Earth and in the atmosphere.)
 - 🍎👏📖🎬 [Solar Energy and the Water Cycle](#) – This website from Earth Labs (Center for Science Teaching and Learning) has background information, a video and instructions for building a physical model of the hydrologic, or water cycle.
- (C) *Collect and analyze data to identify sequences and predict patterns of change in shadows, seasons, and the observable appearance of the Moon over time.*
 - 🍎👏📖 [Moon Phases, Seasons, and Shadows TEKS 4.8C](#) – These Houston, Texas teacher-made resources support this TEK and include videos, documents, and free

reproducible student materials on the phases, seasons and shadows. Moon phases are caused by the Moon's orbit around Earth while Earth orbits the Sun. Seasons are caused by Earth's tilt as it revolves around the Sun.

- 🍎👉📖 [StarDate "Shadowplay" Teacher Guide](#) – This is a two-page pdf with three student activities on changing shadows caused by objects blocking sunlight when the Sun's apparent position in the sky changes.
- 📖 [Patterns of Change on Earth](#) – This is an outstanding, nine-page, concise pdf summary of TEK 4.8C from Socorro ISD. It includes a detailed review of the content in this TEK, labeled illustrations, and a short assessment with answers covering shadows, seasons, Moon phases, and tides (Note: Tides were dropped from this TEK after this resource was published).
- 🎬 [Phases of the Moon \(Video\)](#) (7 min) – This is a short video from Kids Educational Games about why the moon changes its appearance.
- 📖 [Why Does Earth Have Seasons? NOAA SciJinks: All About Weather](#) – This NOAA website with a brief summary of what causes seasons features kid-friendly wording and images.
- 🍎👉📖🎬👁️ [Seasons on Earth](#) – In this comprehensive lesson plan from PBS on seasons, students study satellite data and explore an example of long-term climate change to learn about the seasons, changes in climate, and the role of Earth's tilted axis. It includes detailed information, videos, interactive graphics, activities, and a short assessment.

(end 4th grade)

3rd Grade Science TEKS – [Supporting Only](#)

(5) Matter and Energy – The student knows that matter has measurable physical properties and those properties determine how matter is classified, changed, and used. The student is expected to do the following:

- (C) *Predict, observe, and record changes in the state of matter caused by heating or cooling such as ice becoming liquid water, condensation forming on the outside of a glass of ice water, or liquid water being heated to the point of becoming water vapor.* [Released Items](#)
 -  [Fifth Grade Lesson Investigating Change of State](#) – In this comprehensive lesson on states of matter, students investigate how adding or taking away heat changes the state of matter. They will observe and model evaporation from liquid to gas, condensation from gas to liquid, and freezing from liquid to solid. Videos, activities, guided practice, and a brief assessment are included.
 -  [Matter: Changing States](#) – This website sponsored by Chem4kids with kid-friendly wording and images explains the changes in states of matter (solid, liquid, gas).
 -  [The Changing State of Matter](#) – From ESchool Today, this is a simple summary of the states of matter. The menu on the left has links to more details on each state of matter.
 -  [Chemistry Theater](#) – This website has teacher instructions for students to play the computerized experiment game with interactive variables to discover how the states of matter form. This series of interactive video games was Created by The University of Colorado at Boulder for their PhET (Physics Education Technology) program. Play the following link to access the investigation game: [States of Matter](#) .
 -  [States of Matter for Kids: Change Examples, Science Projects and Activities](#) – This video and four activities from Kids Academy are for exploring states of matter that involve chocolate chip cookies, balloons, and slime.
 -  [States of Matter](#) – This is a lesson plan with six activities from an Illinois science teacher. Student goals in this lesson are as follows:
 - Define matter.
 - Identify the states of matter.
 - Tell about the properties of each state of matter.
 - Demonstrate an understanding of the difference between a physical and a chemical change.
 - Do a performance assessment activity to demonstrate mastery.
 -  [Biology/Chemistry/States of Matter](#) – This is a lesson plan with three parts where students will distinguish similarities and differences of matter and recognize that different states of matter may appear in one substance. The substance that is both solid and liquid is found at this website: [Science Activity: Is This Stuff a Liquid Or a Solid?](#)

(6) Force, Motion, and Energy – The student knows that forces cause change and that energy exists in many forms. The student is expected to do the following:

- (B) *Demonstrate and observe how position and motion can be changed by pushing and pulling objects such as swings, balls, and wagons.* [Released Items](#)

-  [The Force Be With You!](#) This is an informative website from the Southern King School in Canada with detailed information on gravity, friction, magnetism, and other kinds of force. Also includes the following: motion, Newton's Laws, biographies of Sir Isaac Newton, zero gravity, inertia, mass, and weight. (Note: The section called *games* is really a group of multiple-choice quizzes on the various topics.)
-  [Science 1](#) – This comprehensive website contains links to a huge variety of videos, vocabulary sites, activities, and quizzes on the scientific method and physical science content. (Note: Scroll down to the middle of the website for force and motion content.)
-  [Give It a Push!](#) – This comprehensive lesson plan from Florida for 3rd grade on pushing and pulling has complete instructions for the teacher to prepare the class, scripted discussion points, activities directions, and assessments.
-  [How Does Mass Affect the Speed of a Forced Object?](#) – This is an interactive investigation using the PHeT website from the University of Colorado at Boulder. This lesson has reproducible pdf worksheets and instruction to use the simulation game on forces: [Forces and Motion: Basics - Force, Motion, Friction](#).

(7) Earth and Space – The student knows that Earth consists of natural resources and its surface is constantly changing. The student is expected to do the following:

- *(B) Investigate rapid changes in Earth's surface such as volcanic eruptions, earthquakes, and landslides.*
 -  [Erupting Volcanoes!](#) – Students make a model of a volcano in this lesson from ScienceLinks, which also offers links to videos, other activities on volcanoes, and assessments.
 -  [Lesson 8: Landslides Hazards: Learn Science at Scitable](#) – In this clever approach to understanding landslides, students are given a landslide scenario and are asked to investigate the set of questions based on the scenario. The culminating activity is to make a landslide model.
 -  [Earthquakes Rock!](#) – In this comprehensive lesson plan from Teach Engineering on earthquakes with activities, videos, and assessments, students make a physical model of p-waves and s-waves using their bodies. Students also make structures using toothpicks and miniature marshmallows. They test the strength of the structures during a simulated earthquake that takes place on a tray of Jell-O. Other activities include making a model seismograph and reading sample seismograms, learning the Mercalli Scale by illustrating booklets that describe the scale, and learning the Richter scale by illustrating booklets that reflect scales of tens.

(8) Earth and Space – The student knows there are recognizable patterns in the natural world and among objects in the sky. The student is expected to do the following:

- *(D) Identify the planets in Earth's solar system and their position in relation to the Sun.*
 -  [Overview: Planets](#) – This is information on each of the eight major planets from NASA.

- 🍎👏📖🎬👁️ [Meet the Planets](#) – In this comprehensive lesson plan from PBS with hands-on activities and videos on the eight major planets, students will identify the planets in the solar system, observe and describe their characteristics and features, and build a scale model out of everyday materials. Lesson includes a PowerPoint presentation on the planets.
- 🍎👏📖 [Solar System Lesson Plan and Worksheet](#) – In this lesson plan sponsored by Home Science Tools, students will use different size balls in a discovery activity on a scale model of the solar system planets.
- 🍎👏📖🎬 [Solar System Lesson Plan](#) – This lesson has a video, an activity to build a scale model of the solar system, and a clever song on the planets.

(9) Organisms and Environments – The student knows and can describe patterns, cycles, systems, and relationships within the environments. The student is expected to do the following:

- (A) *Observe and describe the physical characteristics of environments and how they support populations and communities of plants and animals within an ecosystem.*
 - 🍎👏📖 [Resources and Animals](#) – In this BioEd Online website, students will observe, examine, discuss and draw a walking stick insect or a crawfish in its natural environment. This activity is from the *Resources and the Environment Teacher's Guide*. Although for use with students in Grades K–2, the lesson is easily adaptable for other grade levels.
 - 🍎👏📖 [Environments and Ecosystems: Lesson](#) – This lesson is part of a series of six lessons in which students use their growing understanding of various environments and the engineering design process, to design and create their own model biodome ecosystems.
 - 📖 [Living and Nonliving Things in the Ecosystem](#) – This is a simple introduction to the physical characteristics of an ecosystem which are known as the nonliving components or the abiotic part of an environment.

(10) Organisms and Environments – The student knows that organisms undergo similar life processes and have structures that help them survive within their environments. The student is expected to do the following:

- (B) *Investigate and compare how animals and plants undergo a series of orderly changes in their diverse life cycles such as tomato plants, frogs, and lady beetles.*
 - 👁️ [Ladybug Life Cycle: By Sandra Reyna Tekes TEKS](#) – This is a 13-slide PowerPoint on the life cycle of a ladybug.
 - 📖 [Tomatosphère: The Life Cycle of a Tomato Plant](#) – This is a comprehensive website on everything you would ever want to know about tomatoes and details of their life cycle, sponsored by the Let's Talk Science organization.
 - 🍎👏📖 [National Agriculture in the Classroom](#) – This is a series of interdisciplinary lessons on tomatoes from the National Agricultural Council, which includes activities for growing and observing the life cycle of tomato plants.

(end 3rd grade)