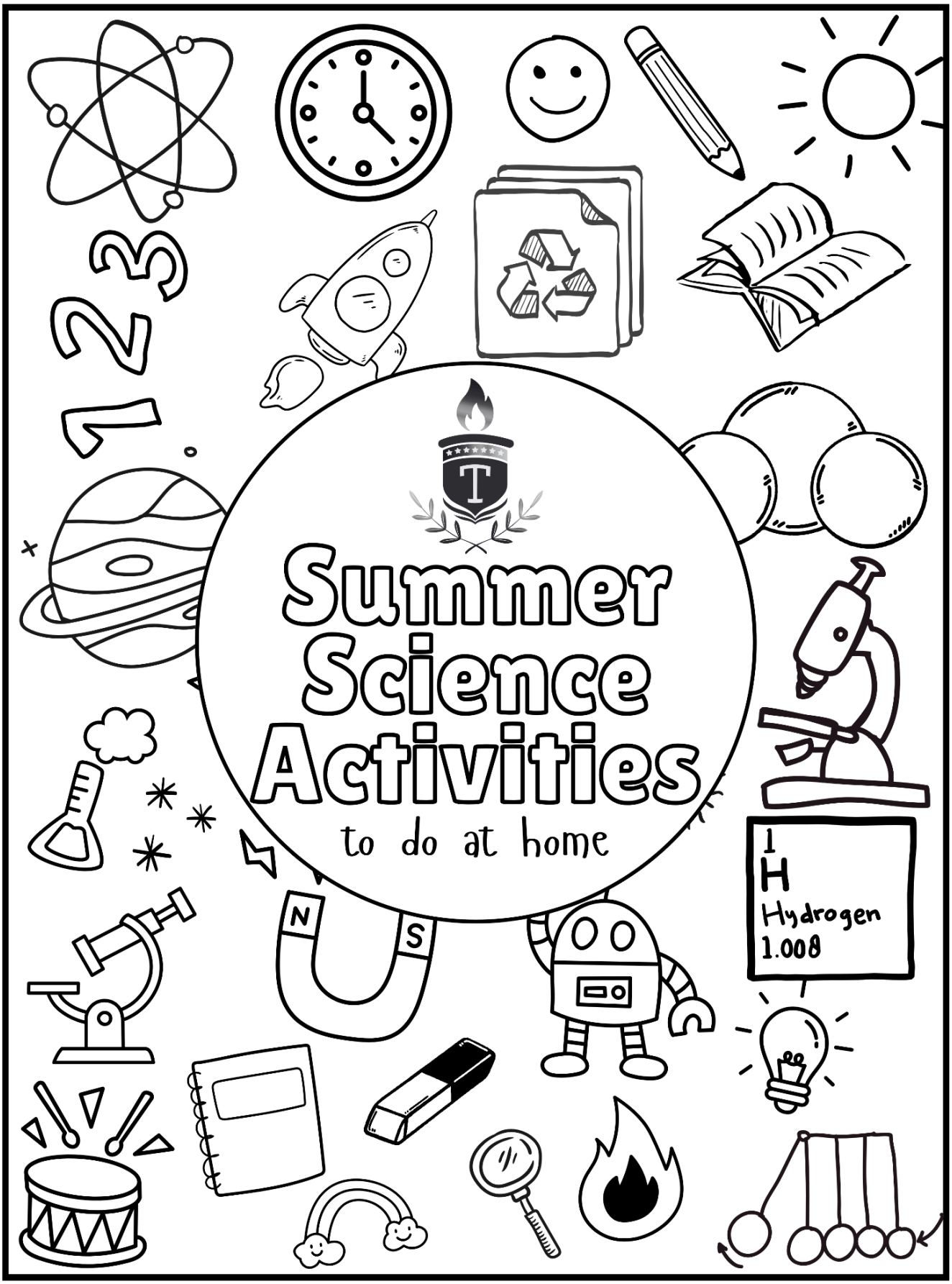
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Science Kindergartner Summer Resources

Kindergartner Activities

Activities for Weather

- Log the weather.
    - o Encourage your student to keep a weather journal for a month. Have them track if the weather is sunny, cloudy, windy, rainy, or snowy.
- Model properties of snow.
    - o Work with your student on modeling snow by using kinetic sand, as this sand will easily pile and crumble like snow.
    - o If they are unfamiliar with snow, explain that it is like rain but only falls when the temperature is cold and that it will melt to water when the weather warms.

Activities for Push and Pull

- Encourage your student to design a carnival game that requires people to use pushes and pulls to play the game, such as a bean bag toss or a game of bowling.
- Visit a harbor or other waterway to observe tugboats pushing or pulling ships.

Activities for Plants and Animals

- Visit a park or botanical gardens to observe various plants that have different water and light needs.
- Safely observe and record evidence of animals getting what they need to live, such as photographing a bird eating seeds from a feeder or a squirrel eating an acorn.
- Research a favorite animal to find out what it eats.

Activities for Environments:

- Research an animal that builds a shelter and the changes that occur to the animal's environment when it creates the shelter.
- Take photos or sketch changes made by animals in your neighborhood or a local park.
- Visit a place in your community where people are restoring a local environment, such as a park or wetland.
- Visit a farm or community garden to see the places where people grow food

ONGOING CONVERSATIONS

Conversations about weather:

- Talk about the local weather throughout the year. Extend the conversation by comparing your local weather to the weather in a different location, such as a place you have visited.

▪ Point out different ways people are protected from the weather. For example, an awning on a building provides people with shade, and a covered bus stop protects people from rain and sun.
▪ Talk about what people do when there is severe weather. For example, outdoor sports games are canceled when there are thunderstorms, and schools close when there is snow and ice.

Conversations about pushes and pulls:

▪ Discuss how pushes and pulls cause objects to move in common activities such as pushing a friend on a swing or pushing and pulling a shopping cart.
▪ Point out pushes and pulls that occur in sports. Discuss how pushes or pulls can change the movement of a player or an object, such as a ball.
▪ Talk about tugboats and other machines or tools that use pushes or pulls to change the movement of an object.

Conversations about how plants and animals, including humans, get what they need to live and grow:

▪ Point out familiar plants and animals, including houseplants and pets, and talk about what the plants and animals need to live and grow.
▪ Point out plants or animals that live in unexpected places and discuss how the plants or animals might be getting what they need to live and grow. ▪ Talk about the natural resources your family uses to get what you need to live, such as the foods you eat or the objects around the home that come from wood or metal.

Environments:

▪ Talk about the different kinds of plants and animals in your local area and the changes they make to their environment to get what they need.
▪ Discuss the ways that people have changed the environment in your local area.
▪ Talk about your favorite foods and whether those foods come from a garden or farm.
▪ Point out different objects around the home that are made of wood

BOOKS

Local libraries are a great resource for fiction and nonfiction books related to weather:

- ▪ Ten Ways to Hear Snow by Cathy Camper
- ▪ When Rain Falls by Melissa Stewart
- ▪ Monsoon Afternoon by Kashmira Sheth

Pushes and pulls:

- ▪ What Do Wheels Do All Day? by April Jones Prince
- ▪ Come Out and Play: A Global Journey by Maya Ajmera and John D. Ivanko
- ▪ Good Morning, Snowplow! by Deborah Bruss

Plants and animals and what they need to live and grow:

- ▪ A Desert Scrapbook by Virginia Wright-Frierson

- The Tinaja Tonight by Aimée M. Bissonette
- This Is the Oasis by Miriam Moss

Environments:

- Plant a Pocket of Prairie by Phyllis Root
- The Sequoia Lives On by Joanna Cooke
- Prairie Dog Song by Susan L. Roth and Cindy Trumbore

WEBSITES

Keep the learning going by exploring these internet resources:

- Visit the Mesa Verde National Park website (https://www.nps.gov/meve/) to learn more about the cliff dwellings of the Ancient Pueblo people.
- Visit the Weather Underground website (https://www.wunderground.com/) to review forecasts and past weather data for locations around the world.
- Visit the Joshua Tree National Park website (https://www.nps.gov/jotr/index.htm) to learn more about life in the Mojave Desert.

Science 1st Grade Summer Resources

1st Grade Activities

Activity for Survival

• Take a nature walk.

o Take your student outside to a location where plants can be found. o Have your student observe various plants.

o Have your student share their observations of at least two plants and discuss the plants' similarities and differences.

Activity for Light

• Put on a shadow puppet show.

o Help your student identify objects made of different materials, with or without holes, that they could use to put on a shadow puppet show.

o Watch your student's shadow puppet show.

o Discuss how the different materials may have affected how a shadow formed.

Activities for Sound

▪ Use common objects around the home to create sound. Have your student explain what caused the sound.

▪ Use objects around the home to build a simple recycled instrument.

▪ Play a game in which one person makes a sound in a room and another person in a different room guesses how the person created the sound.

Activities for Sky

▪ Encourage your student to use drawings, words, or photographs to record the path of a star or the Moon in a night sky journal.

▪ If you travel with your student, compare observations of the night sky from distant locations.

▪ Play a game with your student in which you take turns using the cardinal directions (i.e., north, east, south, and west) to direct each other to different rooms in your home.

ONGOING CONVERSATIONS

Conversations about survival:

▪ Talk about the different plants and animals in your local area.

▪ Talk about plant and animal body parts and how they help different plants and animals survive. For example, birds' wings help them fly away from danger, and fish have gills that allow them to breathe underwater.

▪ Point out different human-made objects that mimic the functions of plant and animal body parts. Talk about how engineers might get ideas from observing how plants and animals use their body parts

Light:

▪ Point out different light sources inside and outside the home, such as lamps, sunlight, and small lights on appliances.

▪ Look for shadows and discuss the objects, surfaces, and light sources that interact to form the shadows.

▪ Compare materials, such as different fabrics, and discuss how much light travels through each material.

Sound:

▪ Listen to music with your student and identify the different sounds in the music. Talk about how people make different sounds.

▪ Point out different sounds inside and outside of your home and discuss what caused each sound.

▪ Point out devices that use sound, light, and color to communicate, such as a crosswalk signal that uses sound, light, and color signals to inform people when it is safe or unsafe to cross a street.

Patterns in the movement of the Sun, stars, and the Moon in the sky:

▪ Point out familiar places or areas that are north, east, south, and west of your home.

▪ Observe the day sky at different times and discuss how the Sun appears to move across the sky.

▪ Observe the night sky at different times and discuss how the Moon and stars appear to move across the sky.

▪ Point out how daytime length changes throughout the year by discussing sunrise and sunset times relative to daily activities that occur at the same time, such as eating dinner, waking up, or going to sleep.

BOOKS

Local libraries are a great resource for fiction and nonfiction books related to survival:

▪ Creature Features: 25 Animals Explain Why They Look the Way They Do by Steve Jenkins and Robin Page

▪ Where in the Wild? Camouflaged Creatures Concealed … and Revealed by David M. Schwartz and Yael Schy

▪ Song of the Water Boatman and Other Pond Poems by Joyce Sidman

Light:

▪ The Astronaut Who Painted the Moon: The True Story of Alan Bean by Dean Robbins

▪ Hello Lighthouse by Sophie Blackall

▪ Flicker Flash by Joan Bransfield Graham

Sound:
▪ The Sound of All Things by Myron Uhlberg
▪ Dark Was the Night: Blind Willie Johnson's Journey to the Stars by Gary Golio
▪ The Bell in the Bridge by Ted Kooser
The Sun, stars, and the Moon:
▪ Seeking an Aurora by Elizabeth Pulford
▪ Summer Sun Risin' by W. Nikola-Lisa
▪ Look Up with Me: Neil deGrasse Tyson: A Life Among the Stars by Jennifer Berne

WEBSITES

Keep the learning going by exploring these internet resources:
▪ Visit The Kennedy Center website (https://www.kennedy-center.org/video/education/musicworld/the-cateura-orchestra-of-recycled-instruments/) to watch a video of the Recycled Orchestra of Cateura.
▪ Visit the NASA Science Space Place website (https://spaceplace.nasa.gov/) to learn more about the Sun, stars, and the Moon in space.

Science 2nd Grade Summer Resources

2nd Grade Activities

Activity for Matter

• Observe water displacement.
    - o Fill a clear container with water.
    - o Add corn syrup (or another dense, thick liquid) to the water.
    - o Have your student observe and share what happens as the thick liquid is added to the water.
    - o Discuss how the water level rose as the thick liquid sank to the bottom. Consider explaining that this is because the thick liquid took up space in the container, displacing the water.

Activity for Earth's Land

▪ Research the natural features of land in national parks. Most national park websites provide detailed pictures and descriptions of their landforms.

Activities for Plants

▪ Plant a seed or a young plant in a planter or in the ground and observe its growth. Encourage your student to use drawings, words, or photographs to record changes to the plant in a journal.

▪ Visit a park or a botanical garden to observe different plants. Sketch or take photos of the plants and research how the plants are pollinated.

▪ Start a seed collection and describe the properties of the seed coverings.

Activity for Biomes

• Go on a scavenger hunt.
    - o Go on a scavenger hunt with your student and count the number of different kinds of plants and animals they find near your home or in a park.

ONGOING CONVERSATIONS

Conversations about matter and its properties:

▪ Play a guessing game where one person describes an object's properties (e.g., shape, size, color) and the other person guesses the object.

▪ Talk about different solids and liquids in the home. For example, many foods are solids and liquids with different properties.

▪ Discuss how different objects around the home are suited for different jobs. For example, many tools have different properties that correspond to their functions.

Conversations about Earth's Land:

▪ Point out the different natural features of land you see as you walk or drive through your local area.

▪ Talk about the natural features of land in places you have visited or would like to visit.
▪ Discuss how wind and water are changing the land in your local area.
▪ Discuss how people are changing the land in your local area. Compare the ways that people change land to the ways that wind and water change land.

Conversations about Plants:

▪ Talk about plants around your home and in your local area, such as in a park or near a body of water.
▪ Point out a construction site and discuss what plant growth might occur if people do not add any plants to the finished site.
▪ Discuss different examples of animal and plant interaction in your community, such as pollination and seed travel.

Conversations about Biomes:

▪ Point out the features of different maps you have in your home or that are posted in your community, such as a bus or trail map.
▪ Talk about the different kinds of plants and animals that live in your local area.
▪ Discuss the different environments and biomes that your student is learning about in school.
▪ Compare the kinds of plants and animals that live in your local area to the kinds of plants and animals that live in an area far away.

BOOKS

Local libraries are a great resource for fiction and nonfiction books related to Matter and properties:

▪ Animal Architects: Amazing Animals Who Build Their Homes by Daniel Nassar and Julio Antonio Blasco
▪ Spit & Sticks: A Chimney Full of Swifts by Marilyn Grohoske Evans
▪ Birds Build Nests by Elizabeth Raum

Earth's Land:

▪ Volcano Rising by Elizabeth Rusch
▪ Island: A Story of the Galápagos by Jason Chin
▪ Earth Verse: Haiku from the Ground Up by Sally M. Walker

Plants:

▪ From Seed to Plant by Gail Gibbons
▪ The Night Flower by Lara Hawthorne
▪ Plant Secrets by Emily Goodman

Biomes:

▪ Sacred Mountain: Everest by Christine Taylor-Butler

▪ Down, Down, Down: A Journey to the Bottom of the Sea by Steve Jenkins ▪ A Strange Place to Call Home: The World's Most Dangerous Habitats & the Animals That Call Them Home by Marilyn Singer

WEBSITES

Keep the learning going by exploring these internet resources:

▪ Visit the Natural Bridges National Monument website (https://www.nps.gov/nabr/learn/nature/ geologicformations.htm) to learn more about natural bridges.

▪ Visit the Hawai'i Volcanoes National Park website (https://www.nps.gov/havo/learn/nature/ volcanoes.htm) to learn more about volcanoes.

▪ Visit the Mount St. Helens Science and Learning Center website (https://www.mshslc.org/) to learn more about Mount St. Helens and its eruptions.

▪ Visit the National Park Service Mountains website (https://www.nps.gov/subjects/mountains/ plants.htm) to learn more about plant life in different mountain environments.

▪ Visit the National Park Service Glacier Bay National Park and Preserve website (https://www.nps.gov/glba/learn/nature/naturalfeaturesandecosystems.htm) to learn about the various environments of Glacier Bay in Alaska.

Science 3rd Grade Summer Resources

3rd Grade Activities

Activity for Weather and Climate

- Build a rain gauge.
    - o Cut a 2-liter plastic bottle about one-quarter of the way down from the top of the bottle for your student. Do not discard the top.
    - o Work with your student to place pebbles (about 1 cup) in the bottom of the bottle, making sure that the pebbles are evenly spread across the bottom.
    - o Place the top of the bottle upside down into the bottom of the bottle, creating a funnel. Secure it with paper clips.
    - o Place a ruler on the outside of the bottle and secure the ruler to the bottle with two rubber bands, adjusting the ruler so that the 0-inch mark is even with the top of the pebbles.
    - o Draw a line on the bottle with a permanent marker so that it is even with the bottom of the ruler.
    - o Fill the bottle with water to that mark.
    - o Have your student check the water level on the rain gauge daily.
        - ▪ If precipitation occurs, measure how much the water line is above the 0-inch mark. Then empty the water and reset the gauge with the pebbles and starting water.
        - ▪ If evaporation or emptying occurs, refill the water in the rain gauge to the 0-inch mark.

Activities for Survival

▪ Help your student keep a nature journal of animals noticed around your home. This data could be graphed and compared over the course of a few days or weeks.
▪ Plant a butterfly bush (Buddleia) or another plant that attracts butterflies at your home or in a nearby community garden. Observe the visitors to these plants.
▪ Visit a natural history museum to explore fossils and timelines of Earth's past.
▪ Visit a nearby nature park or wildlife sanctuary to learn more about local flora and fauna. Take notes or draw sketches to record what you observe.

Activities for Traits

▪ Take photos of or examine different pictures of individuals from the same species to look for variation among individuals.
▪ Visit a zoo to observe different characteristics and traits of the animals.
▪ Observe plants in your environment. If the plants are the same species, look for shared traits. If they are different species, look for shared characteristics.

Activity for Forces and Motion

• Investigate electric force.
    o Have your student rub an inflated balloon with a wool cloth and place a lightweight plastic bag above the balloon.
        ▪ Note that repulsion should cause the plastic bag to float above the balloon.
    o Have your student rub the inflated balloon with a wool cloth again, but this time place the balloon near other objects.
    o Encourage your student to record and/or share their observations about how the balloon and other objects interact.

ONGOING CONVERSATIONS

Support science learning at home by having Conversations about Weather and Climate:

▪ Talk about how weather affects daily life and plans for the year.

▪ Explore the weather and climate in other locations of interest including where relatives live, previous places you have lived, and places you visit.

▪ Talk about how weather patterns have changed in your area over the last 5–10 years, such as whether it is drier, wetter, hotter, or colder.

▪ Discuss family plans for or find out about community resources related to severe weather events.

Conversations about Survival:

▪ Observe and discuss the different plants and animals you notice in your community. Talk about how the animals and plants are suited for and have adapted to different habitats.

▪ Notice or remember seasonal changes in your community and what happens to the plants and animals during different seasons of the year.

▪ Talk about or research changes in your community and their impact on animal habitats.

Conversations about Traits:

▪ Talk about the characteristics and traits of the different plants and animals near your home. Extend the conversation by talking about the advantages of these characteristics and traits.

▪ Compare the traits of a species in different places that you have visited or might want to visit.

▪ Look for trait similarities and differences in families such as eye color or handedness. Discuss whether these might be inherited traits or traits influenced by the environment

Conversations about Forces and Motion:

▪ Have discussions about forces and motion in everyday life. Ask: Why is it easier to pull a wagon on a smooth sidewalk than on rough grass? Why does a bike speed up when it is going downhill?
▪ Talk about different sports that are played with balls and a striking force. Consider how forces affect the motion of the ball in sports such as baseball, tennis, ping pong, golf, basketball, and soccer.
▪ Draw attention to your daily activities and imagine how an activity such as taking a bath, brushing teeth, or making a bed might be different on the International Space Station.

BOOKS

Local libraries are a great resource for fiction and nonfiction books related to Weather and Climate:
▪ Hurricanes by Seymour Simon
▪ Tornadoes! by Gail Gibbons
▪ Red Sky at Night by Elly MacKay

Survival:
▪ A Butterfly Is Patient, Dianna Hutts Aston and Sylvia Long
▪ Marvelous Mattie: How Margaret E. Knight Became an Inventor, Emily Arnold McCully
▪ Amos & Boris, William Steig

Traits:
▪ Here Come the Humpbacks! by April Pulley Sayre
▪ Creature Features: Twenty-Five Animals Explain Why They Look the Way They Do by Steve Jenkins and Robin Page
▪ Amazing Animals: Elephants by Kate Riggs

Space and Forces and Motion:
▪ Moonshot: The Flight of Apollo 11 by Brian Floca
▪ Team Moon: How 400,000 People Landed Apollo 11 on the Moon by Catherine Thimmesh
▪ Footprints on the Moon by Alexandra Siy

WEBSITES

Keep the learning going by exploring these internet resources:
▪ Visit the NASA Climate Kids website at https://climatekids.nasa.gov/ to see how weather impacts different aspects of life, including food and food production.
▪ Visit the National Weather Service website https://www.weather.gov/cae/justforkids.html, and click on the Weird Weather link to learn all about interesting weather events.

▪ Visit https://journeynorth.org/monarchs to learn more about monarch butterfly migrations in real time. You can even sign up to report your own sightings of monarch butterflies.
▪ Visit https://www.nps.gov/flfo/learn/index.htm to learn more about the Florissant Fossil Beds National Monument.
▪ Visit the Marine Education and Research Society (https://www.mersociety.org/) to learn more about humpback whales.
▪ Observe organisms and look for characteristics of species and traits of individuals of the same species at https://www.inaturalist.org.
▪ Visit the NASA website for students (https://solc.gsfc.nasa.gov/modules/newkz3/index.html) and select Living on ISS to see videos of some creative solutions for living and working in space.
▪ Find out how crew members on the International Space Station live. Visit this NASA website: https://www.nasa.gov/mission_pages/station/expeditions/index.html.

Science 4th Grade Summer Resources

4th Grade Activities

Activities for Earth's Features

▪ Help your student start a rock collection. Consider using a field guide to classify the rocks you find.

▪ While walking or driving, ask your student to notice and describe land and water features.

▪ Visit a nearby dam or related website and discuss a dam's purpose.

▪ Help your student plan a visit to an interesting land feature in your area. Take pictures or draw a sketch to capture the details.

Activities for Energy

• Construct and explore energy with a rubber band box.
    - o Help your student stretch 4 or more rubber bands (varied widths) around a shoebox without its lid, spacing the bands evenly.
    - o Weave a pencil through the rubber bands at one end of the box.
    - o Have your student pluck the rubber bands and then observe and record what happens.
        - ▪ Encourage your student to explore how sound made with the rubber band box can change.

• Explore energy with a kazoo.
    - o Have your student blow air into a kazoo with different types of breath (soft, medium, and hard), observing and recording what happens.
        - ▪ Encourage them to explore how sound made with the kazoo can change

Activities for Senses and Responses

▪ Observe animals and notice how they use their senses and respond to their environments. This could be done with pets, animals near your home, at a zoo, or even by watching a nature program. Remember to always be careful while observing wild animals or unfamiliar pets.

▪ Experiment with your senses. Try closing your eyes and naming sounds or try tasting foods with your eyes closed or nose pinched.

▪ Explore how sound travels through materials such as PVC pipe, cardboard tubes, or water.

Activities for Light

▪ Look for complex shadows, such as shadows caused by multiple light sources shining on an object. Try drawing a model that explains how the shadows are made.

▪ Observe the changes in light during the day and notice how objects and shadows look different throughout the day.

▪ Visit a body of water, such as a pond, lake, river, or ocean, or create a body of water in your sink. Look at the water from different perspectives (close, far, low, high), and draw a model of each perspective.
▪ Choose a technology that you use for communication or navigation, such as texting or GPS, and give it up for a day. How does it impact your day? What can you use instead?

ONGOING CONVERSATIONS

Support science learning at home by having Earth's Features:
▪ Talk about land and water features in your area, places that you have visited, or places you would like to visit.
▪ Notice how the landscape changes after a rainfall and look for erosion. Consider comparing how the Grand Canyon formed to a hole in pavement that keeps getting bigger over time.
▪ Discuss the different ways humans have changed the landscape to meet transportation, housing, or other needs.

Energy:
▪ Talk about ways you use energy. Consider energy use in specific rooms of your home or energy use at different times of the day.
▪ Classify energy in your home by using categories such as electric current, sound, heat, and light.
▪ Talk about the relationship between speed and energy. For example, see how wind speed affects a pinwheel. This also relates to wind and windmills. ▪ Ask about a problem your student noticed and what could be invented or done to solve the problem like William Kamkwamba did in The Boy Who Harnessed the Wind.

Sense and Response:
▪ Talk about how your senses help you get information.
▪ Share examples of animals sensing information humans cannot. For example, a dog might notice someone approaching a door before there is a knock.
▪ Think of times when your senses have been altered, such as a cold that kept you from smelling your food. How did it affect your other senses, for example, your sense of taste?
▪ Discuss the ways that your senses help you make decisions. For example, consider how people use their senses to determine whether it is safe to cross a street.

Light:
▪ Share stories about when too much light or too little light made it difficult to do something.
▪ Share stories about when the color of something made it difficult to see.

▪ Talk about how you use communication and navigation technology, such as a cell phone or GPS, in your everyday life. What do you think people used before these technologies existed?

BOOKS

Local libraries are a great resource for fiction and nonfiction books related to Earth's Features:

▪ Grand Canyon by Jason Chin
▪ Mountains by Seymour Simon
▪ Finding Out about Hydropower by Matt Doeden

Energy:

▪ Finding Out about Hydropower, Matt Doeden
▪ Wind Turbine Services Technician, Wil Mara
▪ Feel the Wind, Arthur Dorros
▪ The Boy Who Harnessed the Wind, William Kamkwamba

Senses and Responses:

▪ Amazing Animals: Cheetahs by Kate Riggs
▪ Walk with a Wolf by Janni Howker
▪ The Elephant Scientist by Caitlin O'Connell and Donna M. Jackson

Light, sight, and communication:

▪ Amelia Lost: The Life and Disappearance of Amelia Earhart by Candace Fleming
▪ Six Dots: A Story of Young Louis Braille by Jen Bryant
▪ An Eye for Color: The Story of Josef Albers by Natasha Wing

WEBSITES

Keep the learning going by exploring these internet resources:

▪ See short videos about the Grand Canyon and learn more about the fossils in the Grand Canyon when you visit this National Park Service website: https://www.nps.gov/grca/ learn/nature/fossils.htm
▪ Visit https://www.eia.gov/kids/ to learn more about energy topics such as energy sources, history of energy, and using and saving energy.
▪ Visit https://climatekids.nasa.gov/menu/energy/ to explore games and articles about energy
▪ Visit the BBC's Super Senses website (https://www.bbc.co.uk/programmes/b04fhp70) to explore the different ways animals use their senses.
▪ Visit Ask a Biologist from Arizona State University (https://askabiologist.asu.edu/explore/senses) to compare our senses of hearing and touch with what we learned about elephants' senses.

▪ Learn about the science of light and how to protect our night skies at the National Park Service website Night Skies (U.S. National Park Service) (nps.gov).
▪ Get to know Amelia Earhart's story when you visit the Library of Congress website (Amelia Earhart - Meet Amazing Americans | America's Library - Library of Congress (americaslibrary.gov)).
▪ Read more about color blindness at the National Eye Institute website Color Blindness | National Eye Institute (nih.gov)

Science 5th Grade Summer Resources

5th Grade Activities

Activities for Matter

▪ Bake with your student. Many books can help you identify the reactions that occur during baking.

▪ Dissolve sugar in water. Brainstorm ways to test whether the sugar is still present.

▪ Visit older monuments or older gravestones. Look for ways that air, water, and other weather features have changed them over time.

Activities for Ecosystems

▪ Observe a tree and look for how it supports other organisms around it.

▪ Go for a walk and search for common decomposers such as mushrooms. Discuss where you found them and why they live there.

▪ Create a food web featuring local organisms.

▪ Research invasive species in your area. Look into what local wildlife agencies or conservation groups are doing to reduce invasive species' effects.

▪ Participate in a park cleanup and talk about why it is important to maintain shared green spaces.

Activity for Earth Systems

• Demonstrate particles found in air.
    - o Place double-sided tape on an index card.
    - o After some time, have your student observe what they see on the tape.
        - ▪ They likely will see dust and dirt become attached to the tape, which will serve as evidence that air naturally contains particles on which water vapor can condense.

Activity for Orbit and Rotation

• Examine shadows.
    - o Take your student outside on a sunny day to observe shadows, about once an hour.
    - o Assist your student in recording the Sun's position each time.
    - o Encourage your student to use a compass (this could be the compass on your mobile phone) to determine when the shadows fall due north.
        - ▪ Note that when this occurs, the time is solar noon at your location.

ONGOING CONVERSATIONS

Support science learning at home by having Matter:

▪ Have your student classify different substances at home as solid, liquid, or gas. Try to trick your student with substances like cereal or flour, since they are solids but take the shape of the container that they are in (which is usually the sign of a liquid).
▪ Talk about the properties of different items found around the house. Look for signs of change such as tarnish on metal or water rings on wood.
▪ Since we rarely see the gas state of matter, ask your student for evidence that gases are present.
▪ Talk about safety precautions when using common household chemicals such as cleaners.

Ecosystems:

▪ Talk about the plants and animals in your community and how they form an ecosystem.
▪ Compare the different ecosystems where you have lived or visited.
▪ Discuss where the energy in your food comes from and how you use the energy. See if you can trace the flow of energy back to the Sun.
▪ Discuss how humans affect the plant and animal life in your community.

Earth's Systems:

▪ Talk about ways to conserve water around the house, such as watering the lawn at cool times of day to reduce evaporation.
▪ Discuss the impacts of the Dust Bowl and any family stories related to this era.
▪ Notice ways your community has harnessed interactions between Earth's systems to overcome societal challenges, such as growing food sustainably or programs that convert waste into energy.
▪ Discuss ways humans have positively or negatively impacted your local environment, and brainstorm ways to solve the negative impacts.

Motion of Earth and Moon:

▪ Choose different locations on Earth and discuss observations of the sky that would be the same and observations that would differ from your current location.
▪ Imagine you are lost without a map. What are some landmarks you could use to get back home?
▪ Find relatives or family friends who remember the Apollo missions, and talk about their memories.
▪ Discuss whether you think it is a good idea to explore outer space. What are the advantages and disadvantages?

BOOKS

Local libraries are a great resource for fiction and nonfiction books related to Matter and the Statue of Liberty:

▪ At Ellis Island: A History in Many Voices by Louise Peacock

▪ Her Right Foot by Dave Eggers
▪ This Is New York by Miroslav Sasek

Ecosystems:

▪ Seed, Soil, Sun: Earth's Recipe for Food by Cris Peterson
▪ Living Sunlight by Molly Bang and Penny Chisholm
▪ Over and Under the Pond by Kate Messner

Earth Systems:

▪ Out of the Dust by Karen Hesse
▪ Seymour Simon's Extreme Oceans by Seymour Simon
▪ Cycle of Rice, Cycle of Life: A Story of Sustainable Farming by Jan Reynolds

Motion of Earth and Moon:

▪ Find the Constellations by H. A. Rey
▪ Next Time You See the Moon by Emily Morgan
▪ Team Moon: How 400,000 People Landed Apollo 11 on the Moon by Catherine Thimmesh

WEBSITES

Keep the learning going by exploring these internet resources:

▪ Visit the National Park Service Statue of Liberty website (https://www.nps.gov/stli/index.htm) for a virtual tour, live webcams from the torch, and more.
▪ Explore the Library of Congress archives (https://www.loc.gov/item/2004667251/) to see historic newspaper articles about the Statue of Liberty
▪ Visit https://www.nps.gov/ever/learn/nature/mangroves.htm to find out about mangrove ecosystems in Everglades National Park.
▪ Visit https://ocean.si.edu/ocean-life/plants-algae/mangroves to learn about mangroves' adaptations, the organisms they support, and their distribution across our planet.
▪ Visit NASA's Earth Observatory (https://earthobservatory.nasa.gov) to explore images and global maps of Earth's systems from NASA satellites.
▪ Explore the NOAA website about oceans (https://www.noaa.gov/oceans-coasts) to see some of the ways people are working on solutions to disruptions in Earth's systems.
▪ Explore University of Colorado's Gravity and Orbits simulation (Gravity and Orbits - Gravitational Force | Circular Motion | Astronomy - PhET Interactive Simulations (colorado.edu)) to visualize orbits.
▪ Visit NASA's Jet Propulsion Laboratory website (https://www.jpl.nasa.gov/ edu/learn/) for do-it-yourself science projects about space.

Science 6th Grade Summer Resources

6th Grade Activities

Activities for Light

• At your home, look out one window multiple times this afternoon, this evening, and tomorrow morning.

o Make observations and take photographs (without flash) if you are able. Can you see your reflection? How strong or weak is it?

Can you see through? How much can you see through?

What is the difference in light inside and outside?

• Observing Refraction of Light

o Materials needed: tall plastic cup, large plastic straw, sheet of white paper, any color marker, magnifying glass, flashlight, cooking oil, rubbing alcohol, water

o Procedures:

- Fill a tall plastic cup with water.
- Place a large plastic straw in water.

Activities for Sound

•Explain how music produced from a speaker in a truck caused the window in a building across the parking lot to move.

o Make a sketch of what is happening and be sure to include the following in your model:

a. vibrations of the sound source

b. collisions between particles

c. energy transfer

d. changes that happen in the particle density across the medium

• After watching the videos below, draw and annotate a “comic strip” view that shows the way that the wings are moving and changing shape over time. If you don’t have access to the videos, then create a comic strip that is a prediction of what you think you would see.

Mosquitos: https://youtu.be/4lVymwokIpA

Bees: https://youtu.be/LXmsFQV6q5s

Activities for Contact Forces

• Folding and dropping paper: An air interaction investigation

o Take 4 index cards. If you weighed each of the index cards separately, would you expect their mass to be the same or different? **Now carry out the investigation by following this procedure:**

- Brainstorm some ways you could fold, roll, or shape an index card to make it fall **more** quickly when you drop it from a specific height.
- Brainstorm some ways you could fold, roll, or shape an index card to make it fall **less** quickly when you drop it from a specific height.
- Take 4 index cards of the same size and mass, and label the corner of each one (A, B, C, and D).

- Fold them, roll them, and/or shape them into 4 different designs. *Note: You can use scissors to cut them too, but do not completely cut off any part of the index card. You want to keep the mass of each index card the same.*
- Draw a sketch of each design.
- Drop 2 of them together from the same height and record your results.
- Repeat this for all the different combinations (A and B, B and C, C and D, A and C, A and D, B and D) to determine which design moved fastest and which moved the slowest through the air .

• Pulling a shoe with a rubber band: A surface interaction investigation

o Get a ruler.
o Pick any shoe in your house that has shoe laces or a loop.
o Take the rubber band and create a knot called a cow hitch knot by looping the rubber band around the shoe string and putting one end of the rubber band through the rubber band loop. You have now attached a rubber band force detector to your shoe.
o Pick any surface in or around your house. The surface could be carpet, wood, tile, grass, concrete, or some other surface. It is your choice. Place your shoe with the rubber band tied to it on the surface.
o Hook one finger of one hand under the end of the rubber band. Start to pull gently on the rubber band. Hold a ruler a little to the side of the rubber band with your other hand so you can measure how far you stretch the rubber band before the shoe will move.
o Record in the table below the distance the rubber band stretched before the shoe moved.
o Investigate four different surfaces. Keep track of how far the rubber band stretches for each surface.

Shoe and Surface Investigation Data Table

	Surface #1	Surface #2	Surface #3	Surface #4
Description of the surface tested				
How far the rubber band stretched before the shoe moved (cm)				

<u>Activities for Forces at a Distance</u>

▪ Get a compass and put it near a variety of objects or devices you have at home. Keep a list of objects or devices you find that have a magnetic field and objects or devices that do not have a magnetic field. Discuss the ones that were the most surprising places.

▪ Ask your family and community members if they know of something that uses electromagnets to make things move. With a friend or family member, use a computer or phone to search the internet for electromagnets that make things move.

Activity for Earth in Space

- Examine shadows.
    - o Take your student outside on a sunny day to observe shadows, about once an hour.
    - o Assist your student in recording the Sun's position each time.
    - o Encourage your student to use a compass (this could be the compass on your mobile phone) to determine when the shadows fall due north.
        - ▪ Note that when this occurs, the time is solar noon at your location.

Activities for Cells and Systems

- Build an animal cell
- Build a plant cell

Activity for Interdependent Relationships

- Discuss the environmental solutions for Zebra Mussels

ONGOING CONVERSATIONS

Support science learning at home by having Light:

▪ Why do we sometimes see different things when looking at the same object?

▪ Our phenomenon is an object that looks different in different conditions. Where do you see a similar thing in your life? Your home? Your neighborhood or community?

- o Take a photo or hand-draw one example of a related phenomenon from your life.

Support science learning at home by having Sound:

▪ What are some similarities in the way these insects produce sounds and the way instruments produce sounds?

▪ Think about the sound that a bee, mosquito, or fly makes as it flies near your ear. Each produces a buzzing sound as they fly. Then, go to the links provided and analyze one of the slow motion videos below of one of the insects flying to figure out what might be producing these sounds as they are doing this. Both videos are posted on youtube:

Mosquitos: https://youtu.be/4lVymwokIpA

Bees: https://youtu.be/LXmsFQV6q5s

▪ How does the way the wings of these insects make sounds compare to the way that instruments make sounds?

Support science learning at home by having Contact Forces:

▪ Discuss materials used to protect objects or devices with the following factors in mind:

- o Force reduction- how well the material reduces force on an object that it is protecting.
- o Reusable- It can collide with other objects again and again and still be reused.
- o Robust- how well the device will work to protect heavy objects in a collision.
- o Recyclable- how easy it is to recycle the material based upon availability of recycling sites for that material.
- o Biodegradable- how well the material will biodegrade when thrown out.
- o Low material cost- how cheap the material is for the same size sample.

o Low cost to work with the material in a design- how inexpensive it is to pay a worker to use that material to create a design solution.
o Water used for production- how much water goes into the creation of that material.
o Does not contribute to climate change- how small of an impact the creation of the material has on climate change.

Support science learning at home by having Forces at a Distance:
▪ What did you find that has a magnetic field?
▪ How did you test it?
▪ How do you know it has a magnetic field?
▪ What do many of these have in common?
▪ What did you find that does not have a magnetic field?
▪ How did you test it?
▪ How do you know it does not have a magnetic field?

Support science learning at home by having Motion of Earth and Moon:
▪ Choose different locations on Earth and discuss observations of the sky that would be the same and observations that would differ from your current location.
▪ Imagine you are lost without a map. What are some landmarks you could use to get back home?
▪ Find relatives or family friends who remember the Apollo missions, and talk about their memories.
▪ Discuss whether you think it is a good idea to explore outer space. What are the advantages and disadvantages?

BOOKS OR READINGS
Local libraries are a great resource for fiction and nonfiction books related to Light:
Reading: How do eyeglasses help people see better?
Reading: Walt Disney Concert Hall Case Study
Sound:
Reading: How do insects make sounds?
Reading: Hearing in Elephants, Dogs, and Humans
Contact Forces:
Reading: How does touch work?
Forces at a Distance:
Reading: **Reading: Magnetic Levitation Trains**

WEBSITES
Keep the learning going by exploring these internet resources:
https://onlinetonegenerator.com/
https://www.amnh.org/learn-teach/curriculum-collections/river-ecology