

| Ohio State Standards | ESS Presentations |
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| Earth and Space Sciences | |
| Kindergarten | |
| The Universe | |
| 1. Observe that the sun can be seen only in the daytime, but the moon can be seen sometimes at night and sometimes during the day. | Weather |
| Processes That Shape Earth | |
| 2. Explore that animals and plants cause changes to their surroundings. | |
| 3. Explore that sometimes change is too fast to see and sometimes change is too slow to see. | |
| 4. Observe and describe day-to-day weather changes (e.g., today is hot, yesterday we had rain) | Weather |
| 5. Observe and describe seasonal changes in weather. | Weather |
| Grade One | |
| Earth Systems | |
| 1. Identify that resources are things that we get from the living (e.g., forests) and nonliving (e.g., minerals, water) environment and that resources are necessary to meet the needs and wants of a population. | Changing Materials |
| 2. Explain that the supply of many resources is limited but the supply can be extended through careful use, decreased use, reusing and/or recycling. | Pollution |
| Processes That Shape Earth | |
| 3. Explain that all organisms cause changes in the environment where they live; the changes can be very noticeable or slightly noticeable, fast or slow (e.g., spread of grass cover slowing soil erosion, tree roots slowly breaking sidewalks). | |
| Grade Two | |
| The Universe | |
| 1. Recognize that there are more stars in the sky than anyone can easily count. | Our Solar System |
| 2. Observe and describe how the sun, moon and stars all appear to move slowly across the sky. | Shadows Days and Seasons Our Solar System |
| 3. Observe and describe how the moon appears a little different every day but looks nearly the same again about every four weeks. | The Moon |
| Earth Systems | |
| 4. Observe and describe that some weather changes occur throughout the day and some changes occur in a repeating seasonal pattern. | Weather |
| 5. Describe weather by measurable quantities such as temperature and precipitation. | Weather |
| Grade Three | |
| Earth Systems | |

K-2 Product
3-5 Product

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| 1. Compare distinct properties of rocks (e.g., color, layering and texture). | Rocks |
| 2. Observe and investigate that rocks are often found in layers. | |
| 3. Describe that smaller rocks come from the breakdown of larger rocks through the actions of plants and weather. | Erosion, Transportation and Deposition |
| 4. Observe and describe the composition of soil (e.g., small pieces of rock and decomposed pieces of plants and animals, and products of plants and animals). | Soil |
| 5. Investigate the properties of soil (e.g., color, texture, capacity to retain water, ability to support plant growth). | Soil |
| 6. Investigate that soils are often found in layers and can be different from place to place. | |
| Grade Four | |
| Earth Systems | |
| 1. Explain that air surrounds us, takes up space, moves around us as wind, and may be measured using barometric pressure. | Changing State Predicting the Weather |
| 2. Identify how water exists in the air in different forms (e.g., in clouds, fog, rain, snow and hail). | Water Cycle Predicting the Weather |
| 3. Investigate how water changes from one state to another (e.g., freezing, melting, condensation and evaporation). | Changing State |
| 4. Describe weather by measurable quantities such as temperature, wind direction, wind speed, precipitation and barometric pressure. | Weather Predicting the Weather |
| 5. Record local weather information on a calendar or map and describe changes over a period of time (e.g., barometric pressure, temperature, precipitation symbols and cloud conditions). | Predicting the Weather |
| 6. Trace how weather patterns generally move from west to east in the United States. | |
| 7. Describe the weather which accompanies cumulus, cumulonimbus, cirrus and stratus clouds. | Predicting the Weather |
| Processes That Shape Earth | |
| 8. Describe how wind, water and ice shape and reshape Earth's land surface by eroding rock and soil in some areas and depositing them in other areas producing characteristic landforms (e.g., dunes, deltas and glacial moraines). | Erosion, Transportation and Deposition |
| 9. Identify and describe how freezing, thawing and plant growth reshape the land surface by causing the weathering of rock. | Erosion, Transportation and Deposition |
| 10. Describe evidence of changes on Earth's surface in terms of slow processes (e.g., erosion, weathering, mountain building and deposition) and rapid processes (e.g. volcanic eruptions, earthquakes and landslides). | Erosion, Transportation and Deposition |
| Grade Five | |
| The Universe | |
| 1. Describe how night and day are caused by Earth's rotation. | Days and Seasons |

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| 2. Explain that Earth is one of several planets to orbit the sun, and that the moon orbits Earth. | Our Solar System |
| 3. Describe the characteristics of Earth and its orbit about the sun (e.g., three-fourths of Earth's surface is covered by a layer of water [some of it frozen], the entire planet surrounded by a thin blanket of air, elliptical orbit, tilted axis and spherical planet). | Days and Seasons Our Solar System Water Cycle |
| 4. Explain that stars are like the sun, some being smaller and some larger, but so far away that they look like points of light. | Our Solar System |
| Earth Systems | |
| 5. Explain how the supply of many non-renewable resources is limited and can be extended through reducing, reusing and recycling but cannot be extended indefinitely | Pollution |
| 6. Investigate ways Earth's renewable resources (e.g., fresh water, air, wildlife and trees) can be maintained. | Pollution |
| Life Sciences | |
| Kindergarten | |
| Characteristics and Structure of Life | |
| 1. Explore differences between living and non-living things (e.g., plant-rock). | Animals and Plants |
| 2. Discover that stories (e.g., cartoons, movies, comics) sometimes give plants and animals characteristics they really do not have (e.g., talking flowers). | |
| Heredity | |
| 3. Describe how plants and animals usually resemble their parents. | Growing Up |
| 4. Investigate variations that exist among individuals of the same kind of plant or animal. | |
| Diversity and Interdependence of Life | |
| 5. Investigate observable features of plants and animals that help them live in different kinds of places. | Living Things |
| 6. Investigate the habitats of many different kinds of local plants and animals and some of the ways in which animals depend on plants and each other in our community. | Living Things |
| Grade One | |
| Characteristics and Structure of Life | |
| 1. Explore that organisms, including people, have basic needs which include air, water, food, living space and shelter. | Living Things |
| 2. Explain that food comes from sources other than grocery stores (e.g., farm crops, farm animals, oceans, lakes and forests). | Growing Plants |
| 3. Explore that humans and other animals have body parts that help to seek, find and take in food when they are hungry (e.g., sharp teeth, flat teeth, good nose and sharp vision). | |
| Diversity and Interdependence of Life | |
| 4. Investigate that animals eat plants and/or other animals for food and may also use plants or other animals for shelter and nesting. | Living Things Growing Plants |

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| 5. Recognize that seasonal changes can influence the health, survival or activities of organisms. | |
| Grade Two | |
| Characteristics and Structure of Life | |
| 1. Explain that animals, including people, need air, water, food, living space and shelter; plants need air, water, nutrients (e.g., minerals), living space and light to survive. | Living Things |
| 2. Identify that there are many distinct environments that support different kinds of organisms. | Living Things |
| 3. Explain why organisms can survive only in environments that meet their needs (e.g., organisms that once lived on Earth have disappeared for different reasons such as natural forces or human-caused effects). | Habitats |
| Heredity | |
| 4. Compare similarities and differences among individuals of the same kind of plants and animals, including people. | |
| Diversity and Interdependence of Life | |
| 5. Explain that food is a basic need of plants and animals (e.g., plants need sunlight to make food and to grow, animals eat plants and/or other animals for food, food chain) and is important because it is a source of energy (e.g., energy used to play, ride bicycles, read, etc.). | Living Things Growing Plants Food Chains |
| 6. Investigate the different structures of plants and animals that help them live in different environments (e.g., lungs, gills, leaves and roots). | Living Things Growing Plants Habitats |
| 7. Compare the habitats of many different kinds of Ohio plants and animals and some of the ways animals depend on plants and each other. | Living Things Growing Plants Habitats |
| 8. Compare the activities of Ohio's common animals (e.g., squirrels, chipmunks, deer, butterflies, bees, ants, bats and frogs) during the different seasons by describing changes in their behaviors and body covering. | |
| 9. Compare Ohio plants during the different seasons by describing changes in their appearance. | |
| Grade Three | |
| Heredity | |
| 1. Compare the life cycles of different animals including birth to adulthood, reproduction and death (e.g., egg-tadpole-frog, egg-caterpillar-chrysalis-butterfly). | Growing Up |
| Diversity and Interdependence of Life | |
| 2. Relate animal structures to their specific survival functions (e.g., obtaining food, escaping or hiding from enemies). | Adaptations |
| 3. Classify animals according to their characteristics (e.g., body coverings and body structure). | Animals and Plants Habitats |
| 4. Use examples to explain that extinct organisms may resemble organisms that are alive today. | Fossils |

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| 5. Observe and explore how fossils provide evidence about animals that lived long ago and the nature of the environment at that time. | Fossils |
| 6. Describe how changes in an organism's habitat are sometimes beneficial and sometimes harmful. | Habitats Adaptations Interdependence |
| Grade Four | |
| Heredity | |
| 1. Compare the life cycles of different plants including germination, maturity, reproduction and death. | Plant Reproduction |
| Diversity and Interdependence of Life | |
| 2. Relate plant structures to their specific functions (e.g., growth, survival and reproduction). | Growing Plants Plant Reproduction |
| 3. Classify common plants according to their characteristics (e.g., tree leaves, flowers, seeds, roots and stems). | Growing Plants Plant Reproduction |
| 4. Observe and explore that fossils provide evidence about plants that lived long ago and the nature of the environment at that time. | Fossils |
| 5. Describe how organisms interact with one another in various ways (e.g., many plants depend on animals for carrying pollen or dispersing seeds). | Plant Reproduction Interdependence |
| Grade Five | |
| Diversity and Interdependence of Life | |
| 1. Describe the role of producers in the transfer of energy entering ecosystems as sunlight to chemical energy through photosynthesis. | Food Chains |
| 2. Explain how almost all kinds of animals' food can be traced back to plants. | Food Chains Interdependence |
| 3. Trace the organization of simple food chains and food webs (e.g., producers, herbivores, carnivores, omnivores and decomposers). | Food Chains Interdependence |
| 4. Summarize that organisms can survive only in ecosystems in which their needs can be met (e.g., food, water, shelter, air, carrying capacity and waste disposal). The world has different ecosystems and distinct ecosystems support the lives of different types of organisms. | Habitats |
| 5. Support how an organism's patterns of behavior are related to the nature of that organism's ecosystem, including the kinds and numbers of other organisms present, the availability of food and resources, and the changing physical characteristics of the ecosystem. | Habitats Adaptations Interdependence |

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| 6. Analyze how all organisms, including humans, cause changes in their ecosystems and how these changes can be beneficial, neutral or detrimental (e.g., beaver ponds, earthworm burrows, grasshoppers eating plants, people planting and cutting trees and people introducing a new species). | Habitats Pollution Interdependence |
| Physical Sciences | |
| Kindergarten | |
| Nature of Matter | |
| 1. Demonstrate that objects are made of parts (e.g., toys, chairs). | |
| 2. Examine and describe objects according to the materials that make up the object (e.g., wood, metal, plastic and cloth). | Marvellous Materials |
| 3. Describe and sort objects by one or more properties (e.g., size, color and shape). | Marvellous Materials |
| Forces and Motion | |
| 4. Explore that things can be made to move in many different ways such as straight, zigzag, up and down, round and round, back and forth, or fast and slow. | Feel the Force |
| 5. Investigate ways to change how something is moving (e.g., push, pull). | Feel the Force |
| Grade One | |
| Nature of Matter | |
| 1. Classify objects according to the materials they are made of and their physical properties. | Marvellous Materials Materials Matter |
| 2. Investigate that water can change from liquid to solid or solid to liquid. | Hot and Cold |
| 3. Explore and observe that things can be done to materials to change their properties (e.g., heating, freezing, mixing, cutting, wetting, dissolving, bending and exposing to light). | Changing Materials Hot and Cold |
| 4. Explore changes that greatly change the properties of an object (e.g., burning paper) and changes that leave the properties largely unchanged (e.g., tearing paper). | Changing Materials |
| Forces and Motion | |
| 5. Explore the effects some objects have on others even when the two objects might not touch (e.g., magnets). | Mysterious Magnets |
| 6. Investigate a variety of ways to make things move and what causes them to change speed, direction and/or stop. | Feel the Force Mysterious Magnets |
| Nature of Energy | |
| 7. Explore how energy makes things work (e.g., batteries in a toy and electricity turning fan blades). | |
| 8. Recognize that the sun is an energy source that warms the land, air and water. | Weather |
| 9. Describe that energy can be obtained from many sources in many ways (e.g., food, gasoline, electricity or batteries). | Energy Forms |
| Grade Two | |

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| Forces and Motion | |
| 1. Explore how things make sound (e.g., rubber bands, tuning fork and strings). | Senses Sounds |
| 2. Explore and describe sounds (e.g., high, low, soft and loud) produced by vibrating objects. | Sounds |
| 3. Explore with flashlights and shadows that light travels in a straight line until it strikes an object. | Shadows Reflection and Refraction |
| Grade Three | |
| Forces and Motion | |
| 1. Describe an object's position by locating it relative to another object or the background. | |
| 2. Describe an object's motion by tracing and measuring its position over time. | |
| 3. Identify contact/noncontact forces that affect motion of an object (e.g., gravity, magnetism and collision). | Forces Gravity Magnets Springs |
| 4. Predict the changes when an object experiences a force (e.g., a push or pull, weight and friction). | Forces Gravity Friction |
| Grade Four | |
| Nature of Matter | |
| 1. Identify characteristics of a simple physical change (e.g., heating or cooling can change water from one state to another and the change is reversible). | Changing State Separating Mixtures |
| 2. Identify characteristics of a simple chemical change. When a new material is made by combining two or more materials, it has chemical properties that are different from the original materials (e.g., burning paper, vinegar and baking soda). | Separating Mixtures |
| 3. Describe objects by the properties of the materials from which they are made and that these properties can be used to separate or sort a group of objects (e.g., paper, glass, plastic and metal). | Materials Matter |
| 4. Explain that matter has different states (e.g., solid, liquid and gas) and that each state has distinct physical properties. | Changing State |
| Nature of Energy | |
| 5. Compare ways the temperature of an object can be changed (e.g., rubbing, heating and bending of metal). | Changing State |
| Grade Five | |
| Nature of Energy | |
| 1. Define temperature as the measure of thermal energy and describe the way it is measured. | Changing State |
| 2. Trace how thermal energy can transfer from one object to another by conduction. | Insulators and Conductors |

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| 3. Describe that electrical current in a circuit can produce thermal energy, light, sound and/or magnetic forces. | Circuits Energy Forms Insulators and Conductors Electromagnets |
| 4. Trace how electrical current travels by creating a simple electric circuit that will light a bulb. | Circuits |
| 5. Explore and summarize observations of the transmission, bending (refraction) and reflection of light. | Reflection and Refraction |
| 6. Describe and summarize observations of the transmission, reflection, and absorption of sound. | Sounds |
| 7. Describe that changing the rate of vibration can vary the pitch of a sound. | Sounds |