# NGSS Earth & Space Concepts (K-5)

| GRD | STNDRD | CONCEPT | OBJECTIVE |
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| K | ESS3-1 | Earth & Human Activity | **Students can Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live**: *Examples of relationships could include that deer eat buds and leaves, so, they usually live in forested areas; and, grasses need sunlight, so they often grow in meadows. Plants, animals, and their surroundings make up a system.* |
| K | ESS3-2 | Earth & Human Activity | **Students can ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather**: *Emphasis is on local forms of severe weather.* |
| K | ESS3-3 | Earth & Human Activity | **Students can communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment**: *Examples of **human impact** on the land could include cutting trees to produce paper and using resources to produce bottles. Examples of **solutions** could include **reusing paper and recycling** cans and bottles.* |
| **GRD** | **STNDRD** | **CONCEPT** | **OBJECTIVE** |
| 1 | ESS-1 | Earth's Place in the Universe | **Students can use observations of the sun, moon, and stars to describe patterns that can be predicted:** *Examples of patterns could include that the sun and moon appear to rise in one part of the sky, move across the sky, and set; and stars other than our sun are visible at night but not during the day.* |
| 1 | ESS-2 | Earth's Place in the Universe | **Students can make observations at different times of year to relate the amount of daylight to the time of year:** *Emphasis is on comparisons of the amount of daylight in the winter to the amount in the spring or fall.* . |
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| 2 | ESS1-1 | Earth's Place in the Universe | **Students can use information from several sources to provide evidence that Earth events can occur quickly or slowly:** *Examples of events and timescales could include volcanic explosions and earthquakes, which happen quickly and erosion of rocks, which occurs slowly (Concepts of stability and change).* |
| 2 | ESS2-1 | Earth's Systems | **Students can compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land**: *Examples of solutions could include different designs of dikes and windbreaks to hold back wind and water, and different designs for using shrubs, grass, and trees to hold back the land.* |
| 2 | ESS2-2 | Earth's Systems | **Students can develop a model to represent the shapes and kinds of land and bodies of water in an area**: *Maps show where things are located; map the kinds of land forms.* |

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| 2 | ESS2-3 | Earth's Systems | **Students can obtain information to identify where water is found on Earth and that it can be solid or liquid:** *Map the kinds of water forms - oceans, rivers, lakes, ponds; solid ice (glaciers) and liquid forms.* |
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| 3 | ESS2-1 | Earth's Systems | **Students can represent data in tables and graphical displays to describe typical weather conditions expected during a given season**: *Examples of data could include average temperature, precipitation, and wind direction (does not include climate change).* |
| 3 | ESS2-2 | Earth's Systems | **Students can obtain and combine information to describe climates in different regions of the world:** *Climate describes a range of measurements of an areas typical weather conditions and how they vary from year to year (concept of patterns of change).* |
| 3 | ESS3-1 | Earth and Human Activity | **Students can Make a claim about the merit of a design solution that reduces the impacts of a weather-related natural hazard**: *Examples of design solutions to weather-related hazards could include barriers to prevent flooding, wind resistant roofs, and lightning rods.* |
| 3 | LS2-1 | Ecosystems: Interactions, Energy and Dynamics | **Students can construct an argument that some animals form groups that help members survive (social interactions and group behavior):** *Being part of a group helps animals obtain food, defend themselves, and cope with changes. Groups may serve different functions and vary dramatically in size.* |
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| 4 | ESS1-1 | Earth's Place in the Universe | **Students can identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time**: *Examples of evidence from patterns could include rock layers with marine shell fossils above rock layers with plant fossils and no shells, indicating a change from land to water over time; and, a canyon with different rock layers in the walls and a river in the bottom, indicating that over time a river cut through the rock (does not include specific knowledge of rock formation or memorization of specific rock formations and layers).* |
| 4 | ESS2-1 | Earth's Systems | **Students can make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation:** *Examples of variables to test could include angle of slope in the downhill movement of water, amount of vegetation, speed of wind, relative rate of deposition, cycles of freezing and thawing of water, cycles of heating and cooling, and volume of water flow.* |
| 4 | ESS2-2 | Earth's Systems | **Students can analyze and interpret data from maps to describe patterns of Earth's features**: *Maps can include topographic maps of* |

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| | | | *Earth's land and ocean floor, as well as maps of the locations of mountains, continental boundaries, volcanoes, and earthquakes. (plate tectonics and large-scale systems interaction; living things affect their regions)* |
| **4** | **ESS3-1** | **Earth & Human Activity** | **Students can obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment:** *Examples of renewable energy resources could include wind energy, water behind dams, and sunlight; non-renewable energy resources are fossil fuels and fissile materials. Examples of environmental effects could include loss of habitat due to dams, loss of habitat due to surface mining, and air pollution from burning of fossil fuels.* |
| **4** | **ESS3-2** | **Earth & Human Activity** | **Students can generate and compare multiple solutions to reduce the impacts of natural Earth processes (limited to earthquakes, floods, tsunamis, and volcanic eruptions) on humans:** *Examples of solutions could include designing an earthquake resistant building and improving monitoring of volcanic activity.* |
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| **5** | **ESS1-1** | **Earth's Place in the Universe** | **Students can support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth**: *limited to relative distances, not sizes, of stars.* |
| **5** | **ESS1-2** | **Earth's Place in the Universe** | **Students can describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth**: *limited to oceans, lakes, rivers, glaciers, ground water, and polar ice caps, and does not include the atmosphere.* |
| **5** | **ESS3-1** | **Earth & Human Activity** | **Students can obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment (human impact on Earth's Systems -** *Examples agriculture, industry, daily life, air, oceans, and outer space.* |
| **5** | **ESS2-1** | **Earth's Systems** | **Students can Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact**: *Examples could include the influence of the **ocean** on **ecosystems**, **landform shape**, and **climate**; the influence of the **atmosphere** on **landforms** and **ecosystems** through weather and climate; and the influence of **mountain ranges** on **winds** and **clouds** in the atmosphere. The **geosphere**, **hydrosphere**, **atmosphere**, and **biosphere** are each a system.* |

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| **5** | **ESS2-2** | **Earth's Systems** | **Students can make observations and measurements to identify materials based on their properties:** *Examples of materials to be identified could include baking soda and other powders, metals, minerals, and liquids. Examples of properties could include color, hardness, reflectivity, electrical conductivity, thermal (heat) conductivity, response to magnetic forces, and solubility (dissolves); density is not intended as an identifiable property.* |