

Dear Parent,

Your child is beginning a unit developed by the Battle Creek Area Mathematics and Science Center. This unit was designed to promote science and engineering literacy and integrate reading and writing skills into high-interest science content. During the next twelve weeks, your child will be actively involved with the *Earth and Space Systems* unit. The key concepts the unit explores include:

1. Earth is made up of four major systems, the atmosphere, the hydrosphere, the geosphere, and the biosphere.
2. Earth's systems interact in many ways to affect Earth's surface materials and processes.
3. The majority of Earth's water is in the ocean, and only a tiny fraction is in streams, lakes, wetlands, and the atmosphere.
4. Human activities have had major effects on land, vegetation, streams, oceans, air, and even outer space. Some communities and individuals are doing things to help protect and preserve Earth's resources and environments.
5. The orbit of Earth around the sun and Earth's rotation on its axis cause observable patterns that give evidence for how we get day and night, seasons, and uneven lighting and heating of the surface.

Earth and Space Systems uses the growing problem of plastic disposables to introduce the atmosphere, hydrosphere, geosphere, and biosphere as Earth's systems. Students explore each system and develop a model to describe the ways systems interact and the effect of change (natural or through human activity) on one or more of the systems. Students develop an understanding that all living things are dependent on the balance between and interaction among the systems. An in-depth exploration into the hydrosphere provides an understanding of the distribution of water on Earth and the very small amount available for use by living things. With their new understanding of Earth's systems and interaction among the systems, students return to the problem of plastic disposables and describe the effect of producing, using, and disposing of plastic bags. Students develop a plan for fifth-graders to preserve and protect Earth's resources and environments.

The effect of gravity within the atmosphere, geosphere, hydrosphere, and biosphere is a common phenomenon throughout the exploration of Earth's systems. After students give evidence of how, on Earth, gravity pulls objects down, they explore the objects in the sky to develop an understanding of the moon, sun, and stars, and the patterns of their changes. They collect data and use patterns to provide an explanation for changes in length of shadows, day and night, moon phases, and seasonal changes in the appearance of some stars in the night sky.

May you enjoy quality time with your child while discussing the concepts involved with the *Earth and Space Systems* unit. Let us know if we may be of assistance.

The Outreach Staff

Battle Creek Area Mathematics and Science Center

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ACTIVITIES TO DO AT HOME

1. Keep a log of the sunrise time, sunset time, and high and low temperatures for several weeks. Discuss the data and relate the length of day and temperature to the season.
2. Start a Moon Watch Journal with your child. Make nightly moon observations and record them in a journal. If it is cloudy and the moon is not visible, check online or in the newspaper and record the phase in the journal.
3. Share stories about the moon that you heard in your childhood with your child. Go to the library and look for books about legends of the moon and folklore that surrounds the moon.
4. Have your child ask their grandparents about the first mission to the moon.
5. Look for current events in newspapers and magazines that relate to space exploration, the International Space Station, satellites, and probes. Start a space scrapbook as a historical timeline of the space explorations.
6. Go to the library and check out books on constellations. Set aside some clear nights to stargaze with your child, identify the constellations, and discuss their apparent movement across the sky. Make a Tube Constellation Viewer with your child. You will need:
 - 1 thick cardboard tube
 - small, different-sized nails
 - 1 flashlight with batteries
 - black construction paper
 - black paint

Using small nails of different sizes, punch out the pattern of a constellation on black construction paper. Place the construction paper over one end of the tube. Paint the inside of the tube black. Insert the flashlight into the other end of the tube, turn off the lights, close the curtains, and project the constellation onto a dark surface. Learn as many constellations as possible, make multiple constellation cards, and share them with the family. Tip: A Pringles can works well for the cardboard tube.
7. Keep a log of the daily water uses in your household. Have your student make a plan to conserve water.
8. Visit nearby bodies of water and identify the watershed in your area. Determine if the body of water is part of the storm drain system.
9. Go on a family hike and identify the different landforms that make up the terrain. Discuss how the rainfall and wind have an effect on the shape of the area.
10. Go to the library and check out books that give information on Earth, the oceans, lakes and rivers, recycling and conservation, protecting the environment, and the sun, the moon, and the stars.