National Aeronautics and Space Administration

A View from the Top:
Looking at Earth from Space

An Educator Guide
corresponding to the grades K-4
Digital Learning Network Videoconference Expedition

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Grades	K-4
Subject Areas	Geography, Science
Code	DLN View From Top K-4 Expedition 0409

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Digital Learning Network (DLN) Expeditions

A DLN Expedition is a one time, live connection that allows students to experience NASA first-hand. Each expedition features an integrated educational package of grade-appropriate instruction and activities centered around a 50-minute videoconference. Students participate in a question and answer session with a NASA education specialist or a NASA subject matter expert. Details on equipment needed and how to request a videoconference may be found at: **http://dln.nasa.gov/dln/**

Expedition Overview
Many of us have marveled at the beautiful photographs of the Earth taken from the Space Shuttle and International Space Station. NASA collects data relating to climate change, weather events, pollution, and land use using Earth Observation Satellites. Join NASA's Digital Learning Network as we work together to develop interpretive skills and learn how to look at space-based photography the same way Earth observation scientists do at NASA.

Grade Level(s) K-4

Focus
NASA scientists study images of Earth taken from space. What can be seen from space and what can we learn from these pictures?

Instructional Objective

- Students will identify landforms (e.g. island, peninsula, river, lake, ocean, etc.) from satellite images.

Outline for *A View from the Top* Videoconference

I. Introduction
II. Senses and Remote Sensing
III. ISS and Satellites
IV. Landforms from Space
V. Weather
VI. Careers
VII. Q &A/Good-Bye

Expedition Videoconference Guidelines

Audience Guidelines

Teachers, please review the following points with your students prior to the event:

- A videoconference is a two-way event. Students and NASA presenters can see and hear one another.
- Students are sometimes initially shy about responding to questions during a distance learning session. Explain to the students that this is an interactive medium and we encourage questions.
- Students should speak in a loud, clear voice. If a microphone is placed in a central location instruct the students to walk up and speak into the microphone.
- Teacher(s) should moderate students' questions and answers.
- To give them confidence, students can write questions on index cards.

Teacher Event Checklist

Date Completed	Pre-Conference Requirements (2-7 days before the videoconference)
	1. Print a copy of the educator guide.
	2. Have students complete a pre-conference activity.
	3. Review vocabulary with students. These terms are likely to be used during the videoconference.
	4. Email a digital picture of the front of your school and questions for the presenter. This will help focus the presentation on the groups' specific needs.
	5. Review the Audience Guidelines above.
	Day of the Conference Requirements
	1. The students are encouraged to ask the NASA presenter questions about the Expedition.
	2. Follow-up questions can be continued after the conference through e-mail.
	Post-Conference Requirements
	1. Feedback from you and some of your students would be appreciated using the online form at: http://dln.nasa.gov/dln/content/feedback/

National Education Standards

National Geography Standards (from www.ncge.org)

Standard 7. The physical processes that shape the patterns of Earth's surface.
Use pictures from instructional materials and hand-drawn sketches to distinguish between different components of Earth's physical systems (e.g., lithospheric features [landforms] such as mountains, hills, plateaus, plains, river valleys, and peninsulas and hydrospheric features such as oceans, lakes, and rivers).

National Science Education Standards (NSES) (from www.nap.edu)

Content Standard D: Earth and Space Science
Changes in the Earth and sky (K-4)
The surface of the Earth changes. Some changes are due to slow processes, such as erosion and weathering, and some changes are due to rapid processes, such as landslides, volcanic eruptions, and earthquakes.

Content Standard F: Science in Personal and Social Perspectives
Changes in environments (K-4)
Some environmental changes occur slowly, and others occur rapidly. Students should understand the different consequences of changing environments in small increments over long periods as compared with changing environments in large increments over short periods.

Pre-Conference Activity

Amelia the Pigeon

Purpose

The Amelia the Pigeon lessons enable students to see how different geographical features look from aerial or space images.
http://science.hq.nasa.gov/kids/imagers/index.html

Procedure

Select one or more lessons from the *Amelia the Pigeon* links found at the IMAGERS website to use before the videoconference.

Amelia the Pigeon uses aerial photography to focus on the benefits of a bird's eye view. Throughout the interactive adventure portion of the website, aerial and satellite imagery are used to demonstrate the advances of remote sensing. *Amelia the Pigeon* presents new insights into habitats as she explores the urban environment of New York City.

Link to interactive story:
http://science.hq.nasa.gov/kids/imagers/amelia/index.html

Link to teachers' guide for K-2 and 3-4 lessons:
http://science.hq.nasa.gov/kids/imagers/amelia/teachersguide/index.html

Vocabulary

Agriculture: The science of planting and harvesting crops, and raising livestock (farm animals). Another word for farming.

Bay: A body of water that is partly enclosed by land.

Cape: A piece of land that sticks out into a sea, ocean, lake, or river.

Climate: The temperature, winds, pressure and humidity patterns in a location occurring year after year. For example, “Arizona has a desert climate. It’s almost always very dry and gets extremely hot on summer days.”

Continent: Large land masses. Earth’s continents are: Africa, Antarctica, Asia, Australia, Europe, North America, and South America.

Delta: A shallow water landform whose bottom is made of the silt, sand, and small rocks that flow until they get deposited at the mouth of a river. A delta is often shaped like a triangle. (It is named after the Greek letter, delta. The capitol letter delta looks like a triangle.)

Desert: A very dry area of land. Some large deserts are the Mojave Desert in the western United States, Sahara Desert in Africa, and Gobi Desert in Asia.

Environment: All the things and conditions that surround a person, animal, plant or object and affect it in any way. The **tropical rainforest** environment consists of lots of rain, mild temperatures, green trees and lots of other plants and animals.

Geography: The study of the locations of living and nonliving things and the way they affect one another. Map-making is in the field of geography.

Island: A piece of land that is surrounded by water on all sides.

Isthmus: A narrow strip of land with water on two sides connecting two larger land masses.

International Space Station: A spacecraft orbiting the Earth in which microgravity experiments are performed. Sixteen countries contribute to these scientific studies.

Lake: A large body of water surrounded by land on all sides. Really huge lakes are often called seas.

Landform: A natural feature of a land surface. Examples: deserts, mountain ranges, glaciers, plains, plateaus, rivers).

Mountain: A very tall, high, natural place on Earth - higher than a hill, made of rock and other material.

Natural: Occurs in nature. In other words, something that isn't made by people.

Natural Satellite: A heavenly body that orbits the Earth or other heavenly body. Our Moon is a satellite of the Earth.

Ocean: A large body of salt water that surrounds a continent. Oceans cover more the two-thirds of the Earth's surface.

Orbit: To circle or go around something. Examples: the International Space Station and the Moon orbit the Earth.

Plains: Flat lands that have small or no hills.

Plateau: A large, flat area of land that is higher than the land around it.

Peninsula: A body of land with water on three sides.

Pollution: The result or process of spoiling a place (the action of polluting) with things that aren't normally there.

- Natural examples: smoke and ash fall.
- Man-made examples: factory and human waste put into bodies of water.

Remote Sensing: Using instruments such as digital cameras or other sensors (like radar or sonar) to observe something at a distance.

Radar: An instrument or sensor that bounces radio waves off an object to "sense" where it is. Police use radar to sense how fast cars are moving.

River: A large, flowing body of water that usually empties into a sea or ocean.

Satellite: Any object (man-made or natural) that orbits another object.

Sensor: An instrument that is able to give characteristics about an object it is pointed at. Like our eyes sense what an object looks like and our hands sense what an object feels like, sensors may sense the shape or speed or temperature of an object.

Silt: Very tiny pieces of sand that settle on the bottoms of creeks, rivers, lakes, and oceans as mud.

Sonar: An instrument or sensor that bounces sound waves off an object underwater to “sense” where it is or how big it is. Submarines and dolphins use sonar.

Strait: A narrow body of water that connects two larger bodies of water.

Vent: A natural or man-made chamber through which something will flow (like air vents in a house or clothes drier, or rock tubes in caves and volcanoes).

Volcano: A mountainous vent in the Earth's crust. When a volcano erupts, it spews out lava, ashes, and hot gases from deep inside the Earth.

Weather: The temperature, winds, pressure and humidity at a place for a short time. For example, “Tomorrow’s weather will be mild and rainy.”

Additional Resources

NASA
For information on exploratory missions, manned spaceflight, and more, please visit this website.
http://www.nasa.gov

NASA Kids Club
For activities, games, stories and more, visit this website specifically designed for kids that are interested in space and NASA.
http://www.nasa.gov/audience/forkids/kidsclub/flash/index.html

NASA Education
For information on curriculum, activities, and student programs for grades K-4, 5-8, and 9-12 respectively.
http://education.nasa.gov/

NASA Observatorium
http://physics.ship.edu/~mrc/astro/NASA_Space_Science/observe.arc.nasa.gov/nasa/core.shtml.html

Landsat
http://landsat.usgs.gov/

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Certificate of Completion

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Instructor *Date*