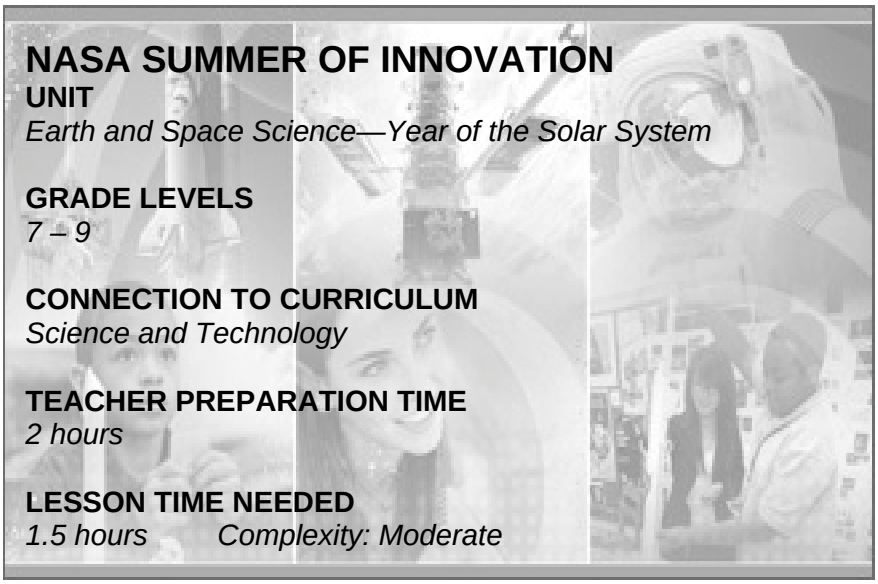
Where Do We Choose To Live and Why?

DESCRIPTION
In this investigation, students use a nighttime image to observe areas of light across the United States and to identify patterns and spatial distributions of human settlements. They explain the reasons for these patterns by answering questions and making inferences about what they observe. Then this knowledge is applied to identify similar patterns and spatial distributions on an unidentified region of the world using a color topographic map and nighttime image.



NASA SUMMER OF INNOVATION
UNIT
Earth and Space Science—Year of the Solar System

GRADE LEVELS
7 – 9

CONNECTION TO CURRICULUM
Science and Technology

TEACHER PREPARATION TIME
2 hours

LESSON TIME NEEDED
1.5 hours *Complexity: Moderate*

OBJECTIVES
Students will
- Explore the spatial concepts of patterns, dispersion, and density
- Be engaged at looking at satellite images of various places on Earth and be asked what they can learn from those images
- Explain the reasons for the patterns of distribution of human settlements across the globe

NATIONAL STANDARDS

National Science Education Standards (NSTA)
Life Science Standards
- Populations and ecosystems

Science in Personal and Social Perspectives
- Populations, resources, and environments
- Population growth
- Natural resources

National Geography Standards
The World In Spatial Terms
- How to use maps and other geographic representations, tools, and technologies to acquire, process, and report information from a spatial perspective
- How to analyze the spatial organization of people, places, and environments on the Earth's surface

Places and Regions
- The physical and human characteristics of places

Human Systems
- The characteristics, distribution, and migration of human populations on the Earth's surface
- The process, patterns, and functions of human settlement.

MANAGEMENT

You will only be doing Module 2, Investigation 1, "Where do we choose to live and why?" Do not get this investigation confused with the other investigations of the module. Directions are easy to follow.

CONTENT RESEARCH

Why do you live where you live? Where do people choose to live? Why do they choose to live there? People have lived on Earth for thousands of years. Throughout history they have chosen particular settlement locations for many practical reasons. For just as many reasons they have packed up and moved to settle in other areas. Sometimes bloody wars have been fought over the right to settle in a particular region. Also, natural hazards such as floods, earthquakes, and climate changes have influenced people to change the locations of their settlements.

Cities, highways, roads, agricultural areas, industrial regions, and transportation hubs around the world are factors that contribute to the formation of human systems. When the United States was settled, early settlements began in the east and gradually moved westward. Could this be the reason the eastern United States is more densely populated than the west? What if the settlements began in the west and moved eastward instead? How would the United States look today?

NASA has been observing and studying Earth since 1958 with aircraft, spacecraft, satellites, and humans. These observations have generated millions of images and tremendous amounts of data. NASA Earth observations help geographers worldwide to study and answer many questions about human migration and settlement patterns. Where will human settlements be 10, 20, or even 100 years from now? Can humans build settlements on other worlds like Mars or our Moon? Will settlements of other planets become a necessity?

MATERIALS

- Briefing and Logs 1, 2, and 3 (one copy for each student)
- Figure 2: United States at night puzzle (one per student or student group)
- Figure 5: United States relief map (one per student or student group)
- U.S. road/travel map or atlas
- World map or globe
- Overhead transparency sheet
- Overhead markers (light colors)
- Clear cellophane tape
- Scissors

Key Terms:

- Pattern: refers to the arrangement of items within a distribution in terms of density, clustering, alignment, and orientation.

- Dispersion: refers to whether items are clustered or spread out.

- Density: means the number of items within a defined area. Examining the distribution of lights across the United States will help students understand these three concepts

LESSON ACTIVITIES

- ***Where do we choose to live and why?***
  In this investigation students use a nighttime image to observe areas of light across the United States and to identify patterns and spatial distributions of human settlements. They explain the reasons for these patterns by answering questions and making inferences about what they observe. Then this knowledge is applied to identify similar patterns and spatial distributions on an unidentified region of the world using a color topographic map and nighttime image. http://www.missiongeography.org/II-2-1.pdf

United States at Night

http://apod.nasa.gov/apod/ap970830.html

ADDITIONAL RESOURCES

- **NASA Earth Science Enterprise:**
  http://science.nasa.gov/
- **National Oceanic and Atmospheric Administration (NOAA):**
  http://www.noaa.gov/
- **U.S. Geological Survey (USGS**):
  http://www.usgs.gov/

DISCUSSION QUESTIONS

- After examining a U.S. road map, why are some areas empty and some areas more densely populated? *Due to physical features such as water bodies, mountain ranges, or deserts.)*

- How are these areas connected to each other? *Via roads, rails, or air transportation.*

- Where do most of the larger cities seem to be located? *In the eastern part of the country and along coasts.* Why? *Historical settlement pattern, rainfall, and agriculture.*

ASSESSMENT ACTIVITIES

Use the following log questions from the Student Datasheet.

- Log 1, Questions 1–7
- Log 2, Questions 1–13
- Log 3A
- Log 3B, Questions 1–2

ENRICHMENT

- How does remote sensing help us to observe human activities on Earth?
  http://er.jsc.nasa.gov/seh/Mission_Geography/5-8/Module_2/II-2-2.pdf

- What similar processes occur on both Earth and Mars?
  http://geography.tamu.edu/class/sbednarz/websites/missgeog/II-2-3.pdf

- Is life on Mars possible, and could humans establish settlements there?
  http://geography.tamu.edu/class/sbednarz/websites/missgeog/II-2-4.pdf