

HUMAN-ENVIRONMENT INTERACTIONS

- **Human Footprint**

- **Activity** – Mapping Our Human Footprint (≈30)
 - Students learn about the Human Footprint data set, analyze a map showing where and to what extent humans have influenced Earth, and participate in a class discussion.
 - <https://www.nationalgeographic.org/activity/mapping-our-human-footprint/>

- **Climate Change**

- **Video** – Climate 101: Cause and Effect (2:49)
 - What causes climate change? And what are the effects of climate change? Learn the human impact and consequences of climate change for the environment, and our lives.
 - <https://www.nationalgeographic.org/video/climate-101-cause-and-effect/>
- **Activity** – Earth's Changing Climates (≈45)
 - Students are introduced to the unanswered question about the future of Earth's climate. They explore data showing temperature changes over the past 120 years and data illustrating climate trends over different time scales. Students evaluate the information the data provide and consider the limitations of conclusions based on the data.
 - <https://www.nationalgeographic.org/activity/earths-changing-climates/>
- **Video** – Mitigation and Adaptation: Human Stories of Hope (7:25)
 - Listen as 2016 National Geographic Explorer Victoria Herrmann talks about climate change. Solutions to adapt to these changes and to mitigate our impact on the planet requires listening to human stories to understand what can be utilized locally to respond effectively.
 - <https://www.nationalgeographic.org/media/mitigation-and-adaptation-human-stories-hope/>
- **Video** – Climate 101: Oceans (2:38)
 - Oceans serve as the planet's largest habitat and also help to regulate the global climate. But why is the ocean salty? And how is climate change impacting the oceans? Find out more about the consequences of climate change on the world's oceans and some potential solutions to these changes.
 - <https://www.nationalgeographic.org/video/climate-101-oceans/>
- **Video** – Ocean Impacts of Climate Change (4:15)
 - In this clip from *Years of Living Dangerously*, actor Joshua Jackson scuba dives along the Great Barrier Reef, an ecosystem at risk due to climate change.
 - <https://www.nationalgeographic.org/media/ocean-impacts-climate-change/>

- **Video** – Climate 101: Glaciers (3:51)
 - Glaciers appear on almost every continent. However, glaciers are rapidly melting due to the warming climate. Find out how glaciers form and other interesting facts about glaciers.
 - <https://www.nationalgeographic.org/video/climate-101-glaciers/>
- **Video** – Global Climate Change Through the Lens of Changing Glaciers (6:52)
 - National Geographic Explorer M Jackson is fascinated by glaciers. That fascination takes her to Iceland where she tromps through ever-shifting ice tunnels and leads local students to see their country's largest and most endangered glacier.
 - <https://www.nationalgeographic.org/video/global-climate-change-through-lens-changing-glaciers/>
- **Video** – Sea Level Rise and Coastal Cities (3:16)
 - Maps depict projected sea level rise in Miami, Florida, in 2030, 2060, and 2100, showing impacts on the dense urban development of South Florida's largest metropolitan area.
 - <https://www.nationalgeographic.org/media/sea-level-rise-and-coastal-cities/>
- **Activity** – Climate Change and Rising Seas (≈90)
 - Students identify the difference between global warming and climate change. They learn what causes global rise in sea level, and they test predictions about sea level rise through a hands-on experiment.
 - <https://www.nationalgeographic.org/activity/climate-change-and-rising-seas/>
- **Map** – Sea Level, Climate Change, and the Chesapeake Bay
 - National Geographic created this map to show how potential relative sea level rise in the Chesapeake Bay may make certain areas vulnerable to inundation. The Chesapeake Bay is the largest estuary in the United States and one of the world's most biologically rich and productive. For decades, because of the high population of its watershed, the bay has been degraded by toxic contaminants, excessive nutrients, and sedimentation that have shrunk critical habitats. Now climate change threatens to undo conservation efforts. Bay water is two degrees warmer than in the 1960's, and while global seawater has risen at the rate of six inches in 100 years, the bay has risen nearly a foot because of its naturally subsiding coastal land.
 - <https://www.nationalgeographic.org/hires/sea-level-climate-change-and-chesapeake-bay/>
- **Interactive** – The King Tides Project
 - Learn more about sea-level rise and its effects on coastal communities with this Esri Story Map.
 - <https://www.nationalgeographic.org/interactive/king-tides-project/>
- **Video** – Tackling the Climate Crisis: The World's To Do List (2:55)

- We all have responsibilities to ourselves and to the world - now leaders must join in taking climate action in the lead-up to COP26, the most critical climate summit, yet. The time for action is now. Together, we can tackle climate change, achieve the Global Goals and get the World's To-Do List for people and planet done.
 - <https://www.youtube.com/watch?v=umeUIBZbt8>
- **Energy**
 - **Video** – Humans & Energy (4:33)
 - Some people have too little energy; others burn too much. This video clip also explores why our use of energy affects the atmosphere.
 - <https://www.nationalgeographic.org/media/humans-energy/>
 - **Video** – Energy 101: Lighting Choices (1:46)
 - Learn about energy-efficient light bulbs that can light your home for less money.
 - <https://www.nationalgeographic.org/video/edu-lighting-choices/>
 - **Video** – What are Fossil Fuels? (1:01)
 - What are fossil fuels? How were they formed? Learn how human use of non-renewable energy sources, such as coal, oil, and natural gas, affect climate change.
 - <https://www.nationalgeographic.org/video/what-are-fossil-fuels/>
 - **Map** – Gulf of Mexico: A Geography of Offshore Oil
 - This map, from the September 2010 issue of *National Geographic* magazine, shows the extensive network of oil and gas wells, pipelines, and platforms found in the Gulf of Mexico. This map is one side of a double-sided supplement from *National Geographic* magazine. [Click here](#) to see the other side.
 - <https://www.nationalgeographic.org/hires/gulf-mexico-geography-offshore-oil/>
 - **Video** – Climate 101: Renewable Energy (3:01)
 - There are many benefits to using renewable energy resources, but what is it exactly? From solar to wind, find out more about alternative energy, the fastest-growing source of energy in the world, and how we can use it to combat climate change.
 - <https://www.nationalgeographic.org/video/climate-101-renewable-energy/>
 - **Map** – Electricity Generation from Renewable Energy
 - Use the MapMaker Interactive to find out which countries are getting their electricity from renewable sources of energy and how they are doing it.
 - <https://www.nationalgeographic.org/maps/electricity-generation-renewable-energy-sources/>
 - **Map** – Alternative Energy Use

- Use the MapMaker Interactive to explore alternative energy use by countries across the globe.
 - <https://www.nationalgeographic.org/maps/alternative-energy-use/>
- **Map** – MapMaker: Renewable Energy Capacity in Megawatts, by Year
 - Explore this map layer that displays the quantity of megawatts different countries, areas, and regions around the world have the capacity to generate from renewable sources, as of 2019.
 - <https://www.nationalgeographic.org/maps/mapmaker-renewable-energy-capacity-megawatts-year/>
- **Video** – What is Solar Power? (1:30)
 - What are solar cells, and how do they work? Find out more about solar power - and learn how this renewable resource harnesses the power of the sun into usable energy.
 - <https://www.nationalgeographic.org/video/what-solar-power/>
- **Video** – Solar Power (2:53)
 - California, a leading state in solar power, has found many ways to harness the Sun, the most powerful source of energy on the planet. Cities, such as Sacramento, are working to make solar power competitively priced and reliable with bulk use of solar cells and solar panels. California offers its citizens net metering, the option to sell solar power back to utilities and to earn money. In the Mojave Desert, Kramer Junction, a solar power facility, also creates an impressive amount of power.
 - <https://www.nationalgeographic.org/video/solar-power/>
- **Video** – Energy 101: Solar PV (2:01)
 - Solar photovoltaic (PV) systems can generate clean, cost-effective power anywhere the sun shines. This video shows how a PV panel converts the energy of the sun into renewable electricity to power homes and businesses.
 - <https://www.nationalgeographic.org/video/edu-solar-pv/>
- **Video** – Energy 101: Wind Turbines (2:16)
 - See how wind turbines generate clean electricity from the power of the wind. Highlighted are the various parts and mechanisms of a modern wind turbine.
 - <https://www.nationalgeographic.org/video/edu-wind-turbines/>
- **Activity** – Stakeholder Debate: Wind Energy (≈120)
 - Students investigate conflicts over the use of wind energy in Nantucket Sound, take on the role of a stakeholder in the debate, and hold a town council meeting to decide whether or not a wind energy project should be implemented.
 - <https://www.nationalgeographic.org/activity/stakeholder-debate-wind-energy/>
- **Video** – Energy Conservation (3:08)

save energy and money. This video walks you through many of the new buildings and lets you hear how the town grew back greener than ever.

- <https://www.nationalgeographic.org/video/edu-rebuilding-greensburg/>
- **Activity** – Energy Sources and Energy Use (≈25)
 - Students discuss relationships between energy use and pollution, sort energy sources into renewable and non-renewable, and create a pie chart of the estimated energy use of the class.
 - <https://www.nationalgeographic.org/activity/energy-sources-and-energy-use/>
- **Activity** – Evaluating Other Energy Sources (≈45)
 - Students analyze various energy sources, comparing the costs and benefits of natural gas, coal, biomass, nuclear, wind, hydropower, and solar power for generating electricity. Students use real-world data to evaluate the relative costs and benefits of using different fuel sources to generate electricity.
 - <https://www.nationalgeographic.org/activity/evaluating-other-energy-sources/>
- **Activity** – Energy Efficiency (≈45)
 - Students explore data from the Energy Information Administration (EIA) on electricity flows and electricity consumption in the United States. Using the data, students propose how electricity generation and use can be made more efficient.
 - <https://www.nationalgeographic.org/activity/energy-efficiency/>
- **Water**
 - **Video** – Why Care About Water (2:29)
 - There is the same amount of water on Earth today as there was when the dinosaurs roamed. And just less than one percent of the planet's water is available to meet the daily drinking water, sanitation and food needs of nearly seven billion people and millions of other species. Learn more about water in all its forms and how you can make a difference.
 - <https://www.nationalgeographic.org/video/why-care-about-water/>
 - **Video** – A Unique Water System (2:31)
 - Freshwater is a precious resource worldwide. In the small Japanese village of Harie, residents use a unique method to keep their fresh water clean and clear. Watch this video to discover this rather fishy system.
 - <https://www.nationalgeographic.org/video/keeping-japans-freshwater-fresh/>
 - **Map** – Freshwater Use in the West
 - In the western United States, where rain storms can be few and far in between and droughts are common, urban and agricultural communities alike depend on a vast network of water reservoirs, which gather and store rainwater for future use.
 - <https://www.nationalgeographic.org/photo/freshwater-use-west/>

- **Map** – Freshwater Availability
 - A map showing freshwater availability in countries around the world.
 - <https://www.nationalgeographic.org/photo/waterstress-2008-unep/>
- **Activity** – Using Fresh Water (≈45)
 - Students explore maps to discover the distribution of fresh water resources on Earth, and they examine graphs to discover how fresh water supplies are used by humans.
 - <https://www.nationalgeographic.org/activity/using-fresh-water/>
- **Activity** – Down to the Last Drop (≈15)
 - Explore the impact of human activities on water resources.
 - <https://www.nationalgeographic.org/activity/down-last-drop/>
- **Activity** – Water Quality Degradation in the Ocean (≈150)
 - Students investigate causes of water quality degradation and analyze the relationship between harmful algal blooms, toxic algae, and dead zones. They explore water quality "success stories" and actions to improve water quality.
 - <https://www.nationalgeographic.org/activity/water-quality-degradation-in-the-ocean/>
- **Pollution**
 - **Activity** – Visible and Invisible Pollutants (≈45)
 - Students explore data about the sources and consequences of different types of pollutant emissions.
 - <https://www.nationalgeographic.org/activity/visible-and-invisible-pollutants/>
 - **Video** – Science 101: Plastics (5:45)
 - From polymers to nurdles, learn how plastic is created and what we can do to slow the lasting repercussions this material will have on both our planet and our lives.
 - <https://www.nationalgeographic.org/video/science-101-plastics/>
 - **Activity** – Perils of Plastic (≈60)
 - Students learn about the world’s largest “landfill,” make a connection to their own lives, and calculate how much trash they generate in a week, a year, and ten years.
 - <https://www.nationalgeographic.org/activity/perils-plastic/>
 - **Video** – Ocean Plastics (3:36)
 - Plastic debris is collecting in every corner of our oceans at a rapid pace and wreaking havoc on sea life. National Geographic explorer Heather Koldewey has a profit-making solution to remove one major offender: discarded fishing nets. She shares practical solutions for cleaning up waterways and motivating the world to take action.
 - <https://www.nationalgeographic.org/video/ocean-plastics/>
 - **Activity** – Marine Debris (≈15)

- Investigate marine debris, the role of ocean gyres, and how humans impact trash accumulation.
 - <https://www.nationalgeographic.org/activity/marine-debris/>
- **Video** – Tracking Plastics from Sea to Source (4:18)
 - We’ve all heard about plastic ending up in the ocean, but how does it get there? Join marine scientist and National Geographic Explorer Imogen Napper as she shows us just how the “Sea to Source: Ganges” Expedition team is tackling the ocean plastics problem. From land to water to exploring the socioeconomic behaviors around plastics - it is a multi-team endeavor to try and identify the root of the problem along one of the largest river systems. And hopefully, find a solution.
 - <https://www.nationalgeographic.org/video/tracking-plastics-sea-source/>
- **Map** – Garbage Patches
 - Map of globes showing ocean garbage patches.
 - <https://www.nationalgeographic.org/photo/9gpgp/>
- **Video** – Air Pollution 101 (3:27)
 - What is air pollution? Learn how greenhouse gases, smog, and toxic pollutants effect climate change, and human health.
 - <https://www.nationalgeographic.org/video/air-pollution-101/>
- **Video** – Light Pollution 101 (2:44)
 - Ever since the light bulb's invention 150 years ago, artificial light has illuminated homes, streets, and skies — but with some unintended consequences. Learn about the major types of light pollution, their impact on human health, and how the worldwide glow from artificial light may continue to grow.
 - <https://www.nationalgeographic.org/video/light-pollution-101/>
- **Map** – MapMaker: Light Pollution
 - Light pollution, or artificial light at night, is the excessive or poor use of artificial outdoor light, and it disrupts the natural patterns of wildlife, contributes to the increase in carbon dioxide (CO₂) in the atmosphere, disrupts human sleep, and obscures the stars in the night sky.
 - <https://www.nationalgeographic.org/maps/mapmaker-light-pollution/>
- **Video** – Priceless (4:08)
 - Jessica Alba discusses carbon pricing, the idea that people pay more for items that pollute the environment and less for things created in a sustainable manner, with Yoram Bauman.
 - <https://www.nationalgeographic.org/video/priceless/>
- **Map** – Drilling for Offshore Oil
 - This map illustrates offshore oil production for 2009 and the top 10 platform spills.
 - <https://www.nationalgeographic.org/photo/drilling-offshore-oil/>
- **Map** – Cleaning Up an Unsanitary World

- Sanitation is not only a matter of social convention, but of public health; if human waste contaminates water supplies, it can make people sick, and even stunt the growth of young children.
 - <https://www.nationalgeographic.org/maps/cleaning-unsanitary-world/>
- **Deforestation**
 - **Video** – Bioacoustic Monitoring: A Community Approach to Protecting the Rainforest (6:14)
 - In this National Geographic Inspires video, 2015 National Geographic Emerging Explorer Topher White describes how he uses recycled cell phones to find solutions to the problem of illegal logging in remote rainforests to stop deforestation.
 - <https://www.nationalgeographic.org/media/bioacoustic-monitoring-community-approach-protecting-rainforest/>
- **Wildlife**
 - **Video** – Animals 101: Polar Bears (3:26)
 - How do polar bears survive their Arctic habitat? Is climate change affecting their population? Learn how polar bears have adapted to life on top of the world.
 - <https://www.nationalgeographic.org/video/animals-101-polar-bears/>
 - **Video** – Wolves of Yellowstone (5:19)
 - Gray wolves were reintroduced into Yellowstone National Park in 1995, resulting in a trophic cascade through the entire ecosystem. After the wolves were driven extinct in the region nearly 100 years ago, scientists began to fully understand their role in the food web as a keystone species.
 - <https://www.nationalgeographic.org/media/wolves-yellowstone/>
 - **Video** – Urban Jungles (3:42)
 - Tracker Boone Smith ventures deep into the heart of some of the most crowded cities on the planet to uncover a hidden world where predators and prey collide - outside our windows, above our skyscrapers, and under our feet. As humans continue to build, wildlife is running out of places to go.
 - <https://www.nationalgeographic.org/video/urban-jungles/>
 - **Activity** – Protecting Earth’s Wildlife (~60)
 - Students learn how a growing demand for natural resources threatens habitats and wildlife. They select an issue to focus on and develop a list of actions people could take to reduce or reverse the problem.
 - <https://www.nationalgeographic.org/activity/protecting-earths-wildlife/>
- **Sustainability**
 - **Video** – A Natural Solution (1:53)

- Biopesticides, pesticides derived from natural combatants like plants, animals, and bacteria, are a growing segment of the pesticide market. As more consumers demand safer foods made with fewer harsh chemicals, the demand for these biopesticides grows.
- <https://www.nationalgeographic.org/video/a-natural-solution/>
- **Activity** – Fisheries Sustainability (≈150)
 - Students identify the issues and terminology related to fisheries sustainability and explore the impacts those issues have on specific United States fisheries.
 - <https://www.nationalgeographic.org/activity/fisheries-sustainability/>