



MUSEUM OF
NATURAL HISTORY
AND PLANETARIUM
Roger Williams Park

Our Changing Earth

A Pre-Visit Information Guide for Teachers

NGSS: 3-LS2-1, 3-LS4-1-4, 3-ESS2-1-2, 4-ESS1-1, 4-ESS2-2, 4-ESS3-1-2, 5-ESS3-1, MS-LS4-1, MS-ESS3-2-3, 5

Patterns of change are evident in the Earth's global systems, particularly as they relate to both energy and resources. To help students see how changing one aspect of our world affects others, students make hands on connections showing natural resources, energy, and human activities.

OBJECTIVES

- **Distinguish weather from climate:** Compare short-term atmospheric conditions with long-term regional patterns.
- **Analyze environmental indicators:** Interpret data visualizations or data sets showing rising temperatures, melting ice, and shifting sea levels.
- **Connect global to local:** Identify how worldwide climate shifts affect specific regional ecosystems, communities, and human health.
- **Examine interconnected systems:** Explore feedback loops linking human activities (such as fossil fuel combustion and deforestation) with biological and economic systems.
- **Evaluate response strategies:** Differentiate between climate change **mitigation** (reducing emissions) and **adaptation** (adjusting to environmental changes).
- **Foster personal agency:** Propose actionable, everyday solutions (such as energy conservation, active transport, or community greening) to build student empowerment.

ACTIVITIES

Teachers are encouraged to conduct pre-visit and post-visit classroom discussions and activities with their classes to make the most of their experience.

<https://www.plt.org/activity/prek-8-activity-86-changing-world/>

<https://oceanservice.noaa.gov/education/discoverclimate/>

HELPFUL VOCABULARY

climate - the average weather (usually taken over a 30-year time period) for a particular region and time period; the average pattern of weather for a particular region; climatic elements include precipitation, temperature, humidity, sunshine, wind velocity, and phenomena, such as fog, frost and hail storms

weather - the short-term state of the atmosphere at a specific place and time, describing conditions like temperature, humidity, wind, and precipitation

climate change - the change in long-term weather patterns; changes can cause warmer or colder temperatures; annual amounts of rainfall or snowfall can increase or decrease

global warming - refers to an average increase in the Earth's temperature, which in turn causes changes in climate; a warmer Earth may lead to changes in rainfall patterns, a rise in sea level, and a wide range of impacts on plants, wildlife, and human

atmosphere – the layer of gases that surrounds the Earth

greenhouse effect - the effect produced as greenhouse gases allow energy from the sun to pass through the Earth's atmosphere, but prevent most of the outgoing heat from the surface and lower atmosphere from escaping into outer space

greenhouse gas - any gas that absorbs the sun's heat in the atmosphere, including water vapor, carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), halogenated fluorocarbons (HCFCs), ozone (O₃), perfluorinated carbons (PFCs), and hydrofluorocarbons (HFCs)

extinct - no longer existing, no longer active, or having no living members left