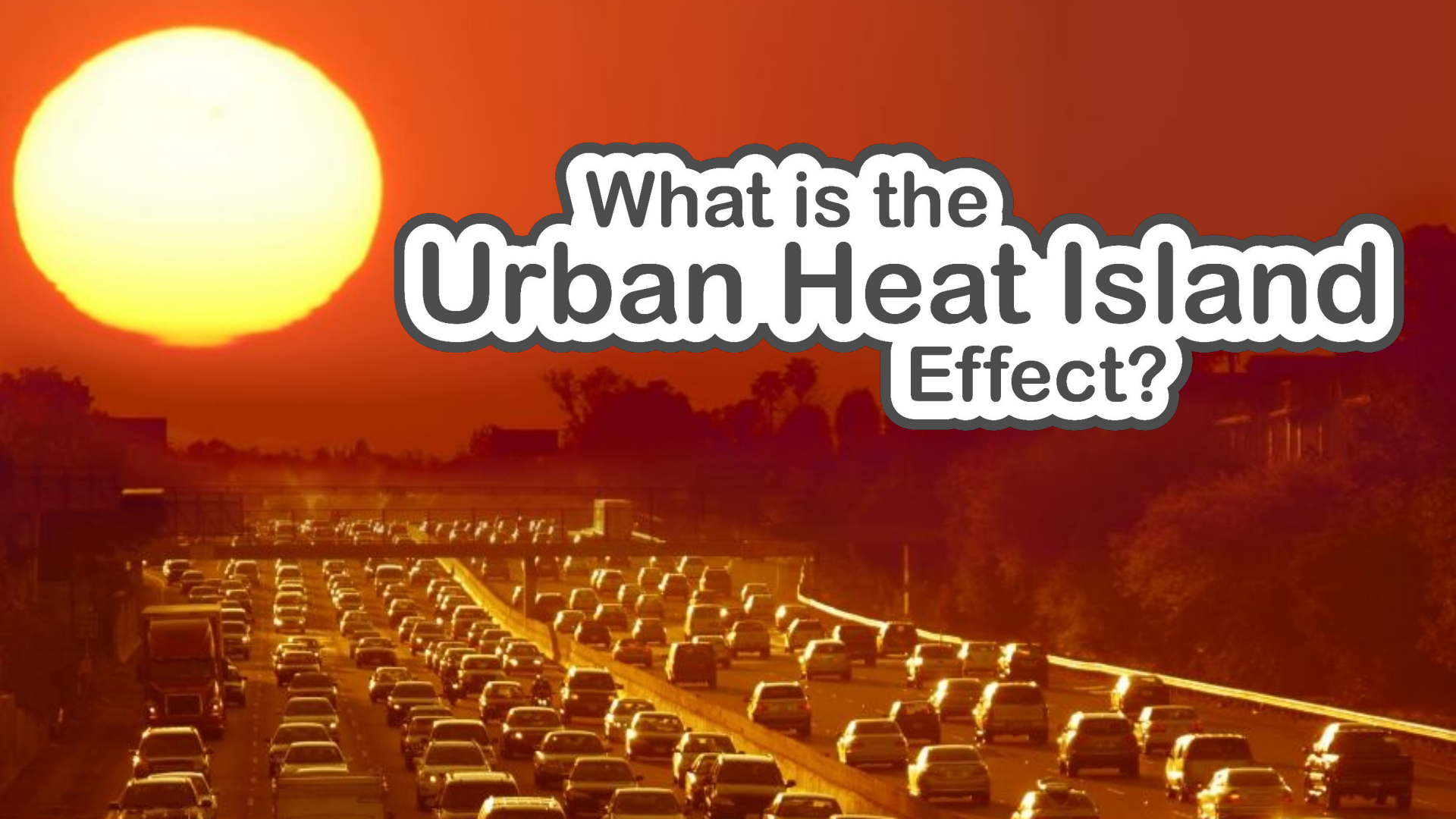
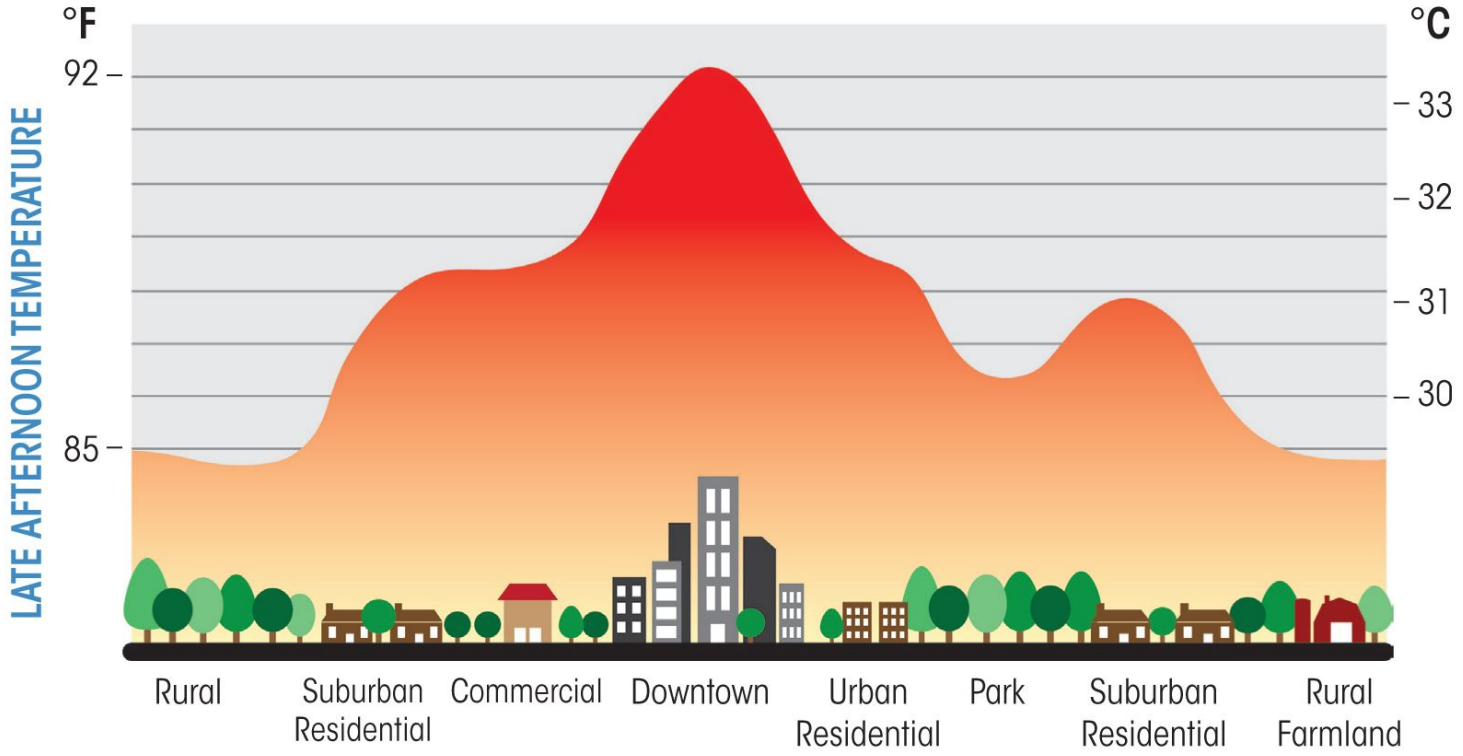

What is the
Urban Heat Island
Effect?

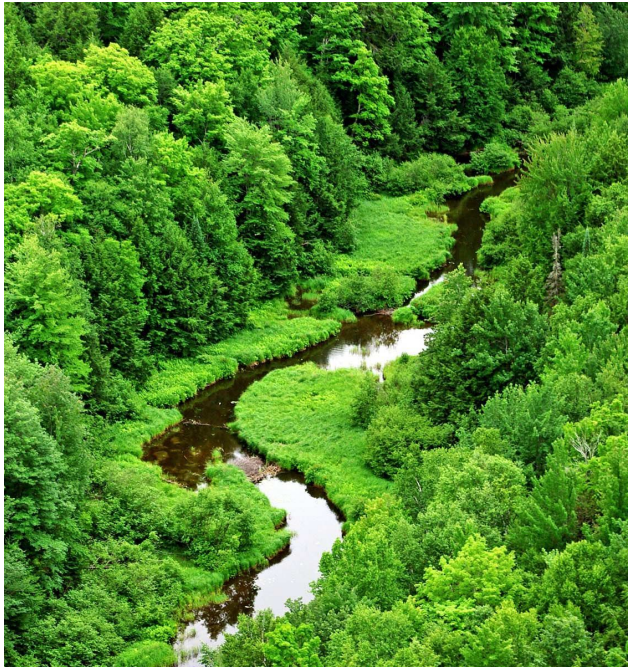
The **urban heat island effect** is the name for the difference in temperature between cities and rural areas due to human development and activity which warm the local environment.

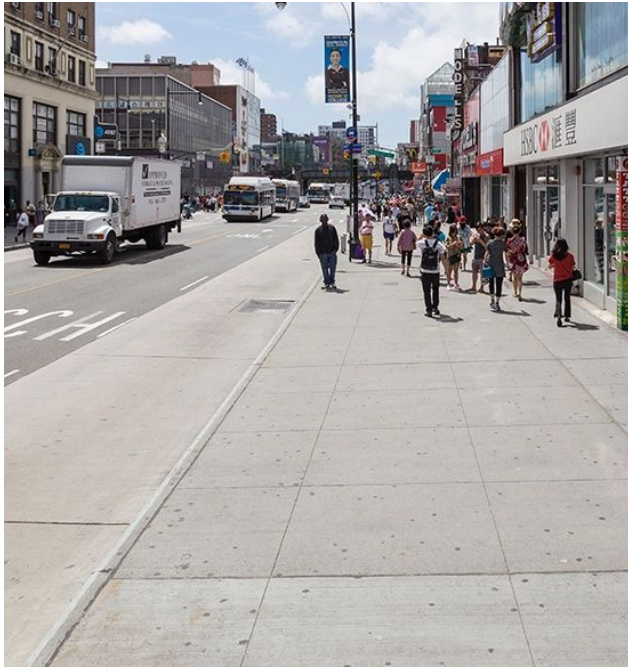


Remember back to the hottest day you have ever experienced.

Where were you? Did your surroundings have an impact on your temperature?

One of the primary ways that nature stays cool is through the **evaporation** of water from ponds and rivers and through **transportation** of water through plants. None of this water is available to provide cooling in cities. Instead, cities are full of dark, impermeable **paving which collects heat**.

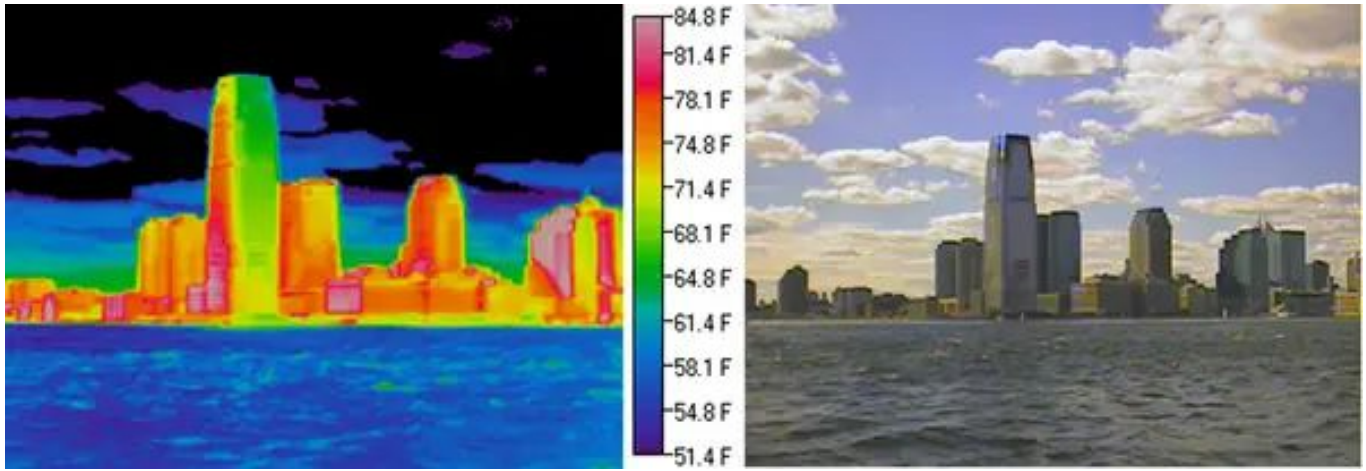




Dark surfaces absorb the sun's radiation into heat, while **lighter colors reflect** the sun's energy. Many building materials in our cities such as flat tar roofs and black asphalt roads convert the sun's radiation into large amounts of heat.

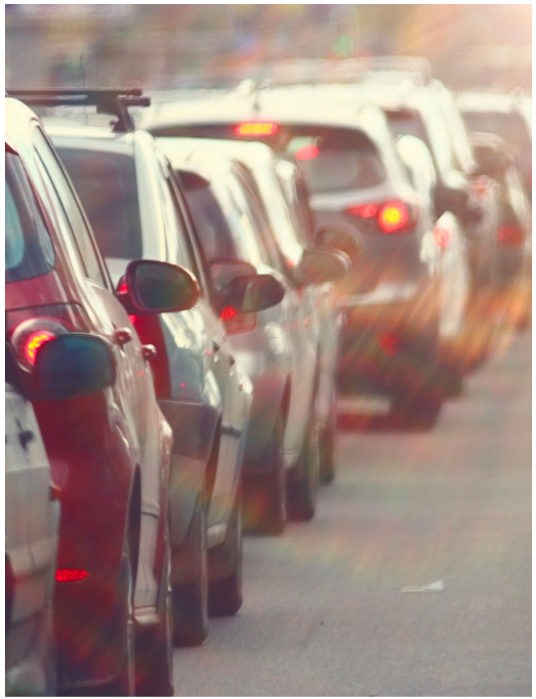
Why do you think cities are built with dark materials and very few plants and water bodies?

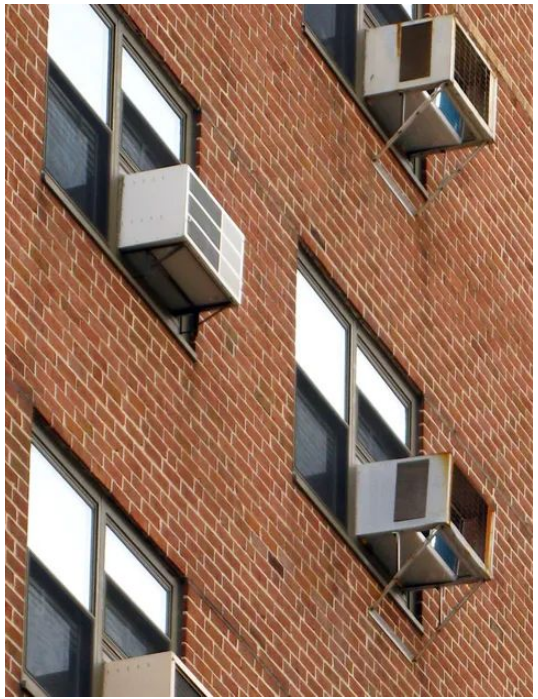
The urban heat island effect can result in cities being as much as **10°F (5.6°C) hotter** during the day and **22°F (12.2°C) hotter** at night. The difference is greater at night because the concrete and asphalt that cities are made of absorb and store the sun's heat from the day and radiate it at night.



Buildings and roads contain a lot of **thermal mass**, which means they store a lot of heat during the day and are slow to release the heat overnight.

People in cities also produces heat in many of our day to day activities. Vehicles, air-conditioning units, buildings, and industrial facilities all emit heat into the urban environment contributing to UHI.





The urban heat island effect can have **health impacts** on vulnerable populations such as the **elderly** and those with existing health conditions. Heat-related illnesses such as **heat exhaustion** and **heat stroke** are often the dangerous results of heatwaves.

The urban heat island effect has a negative impact on the people, the nature, the air quality, and the energy consumption of a city. Luckly, there are ways that we can measure and reduce its impact.