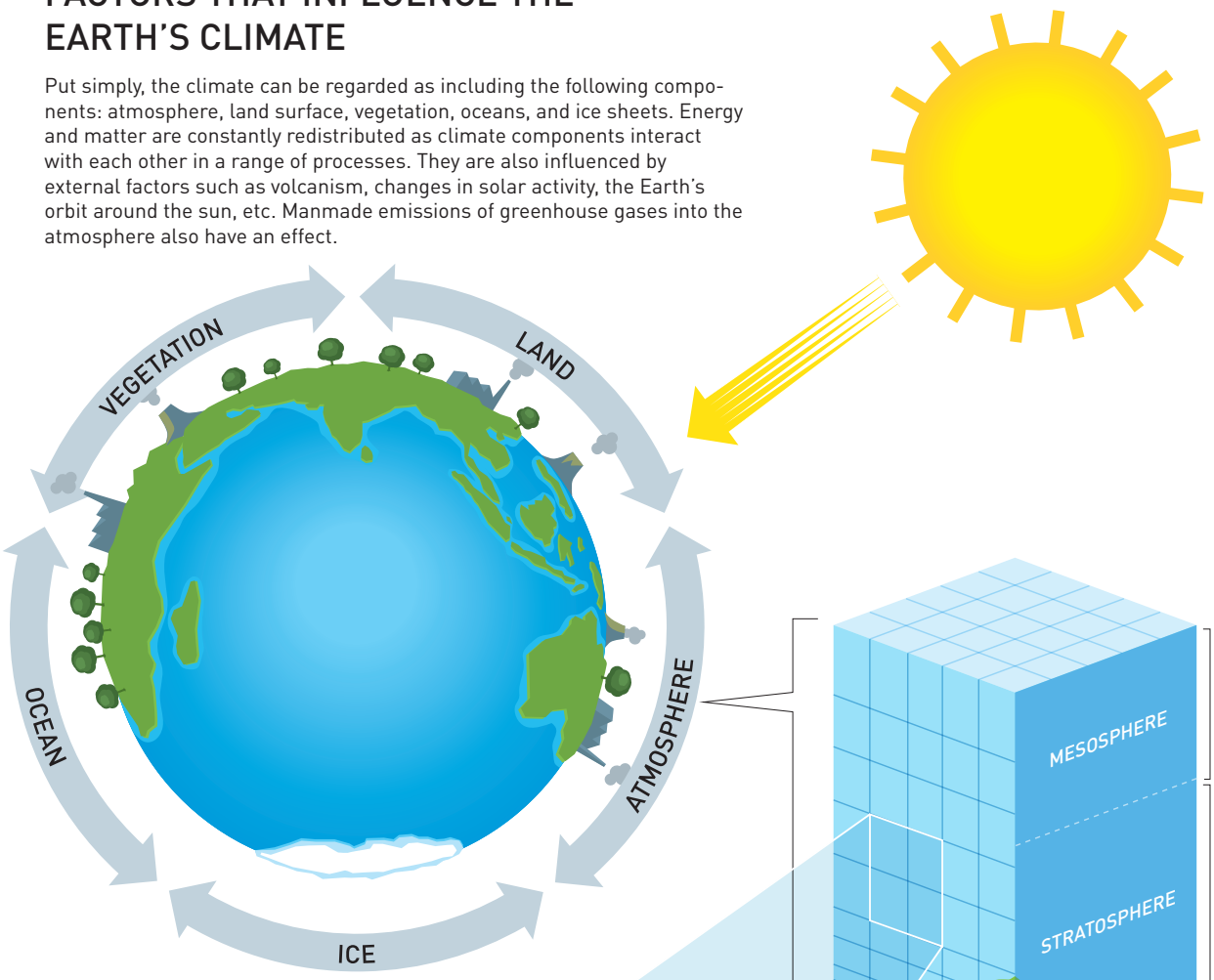
FACTORS THAT INFLUENCE THE EARTH'S CLIMATE

Put simply, the climate can be regarded as including the following components: atmosphere, land surface, vegetation, oceans, and ice sheets. Energy and matter are constantly redistributed as climate components interact with each other in a range of processes. They are also influenced by external factors such as volcanism, changes in solar activity, the Earth's orbit around the sun, etc. Manmade emissions of greenhouse gases into the atmosphere also have an effect.



CLIMATE MODELLING

In a climate model, the atmosphere is divided into a three-dimensional grid along the Earth's surface and up into the atmosphere. The atmosphere's movement and conservation of energy, water and mass follow physical laws that are described using mathematical formulas. Climate modelling then involves the stepwise calculation of the development of parameters such as temperature, precipitation and wind for each cell in the grid.

UP THROUGH THE ATMOSPHERE

The atmosphere is divided into different layers depending on how the average temperature changes with height above the Earth's surface. The lowest layer, the troposphere, has around 70-80 per cent of the atmosphere's mass. In a climate model, the three-dimensional grid that is used in the calculations is also densest close to the surface, becoming less so the higher it reaches in the atmosphere. A climate model can also include the oceans. The three-dimensional grid then continues down below the water's surface so that processes that influence the climate can also be included in the calculations.