

Handout

Computational Thinking Mind-Map

In pairs, create a mind-map reviewing the concept of computational thinking.

Computational Thinking

Climate Change Terminology

Use a variety of resources, such as textbooks and the internet, to research, define the following terms, and relate the terms to climate change.

Albedo: The ratio of reflected to incident light; albedo can be expressed as either a percentage or as a fraction of 1. Snow covered areas have a high albedo (up to about 0,9 or 90%) because of their white color, while vegetation has a low albedo (generally about 0,1 or 10%) because of its dark colors and because of the light that is absorbed for photosynthesis. Clouds have an intermediate albedo and are the most important contributor to the earth's albedo. The Earth's aggregate albedo is approximately 0,3.

Anthropogenic: Means originating in human activity. Emissions of greenhouse gases, greenhouse gas precursors, and aerosols caused by human activities. These activities include the burning of fossil fuels, deforestation, land use changes, livestock production, fertilization, waste management, and industrial processes.

Atmosphere: Atmosphere refers to the gases surrounding a star or planetary body held in place by gravity. A planetary body is more likely to retain an atmosphere over time if gravity is high and the temperature of the atmosphere is low. The composition of the Earth's atmosphere is about 78 percent nitrogen, 21 percent oxygen, 0.9 percent argon, with water vapor, carbon dioxide, and other gases. The atmospheres of other planets have a different composition. The atmosphere changes from the ground up and consists of four distinct layers: troposphere (8-14,5 km), stratosphere (14,5-50 km), mesosphere (50-85 km) and thermosphere (85-600 km). The composition of the Sun's atmosphere consists of about 71.1 percent hydrogen, 27.4 percent helium, and 1.5 percent other elements.

Carbon Cycles: Circulation of carbon atoms through the Earth systems as a result of photosynthetic conversion of carbon dioxide into complex organic compounds by plants, which are consumed by other organisms, and return of the carbon to the atmosphere as carbon dioxide as a result of respiration, decay of organisms, and combustion of fossil fuels.

Heat Sinks: An environment or medium capable of absorbing heat from an object with which it is in thermal contact without a phase change or an appreciable change in temperature. Oceans can act as a heat sink that can absorb excess heat for periods of time before releasing that heat back into the atmosphere causing weather phenomena such as El Niños. The amount of heat that the oceans can store is extremely large when compared to the land or atmospheric capacity.

Hydrosphere: Hydrosphere, discontinuous layer of water at or near Earth's surface. It includes all liquid and frozen surface waters, groundwater held in soil and rock, and atmospheric water vapour. This includes the waters of the ocean; rivers, lakes, and other bodies of surface water in liquid form on the continents; snow, ice, and glaciers; and liquid water, ice, and water vapour in both the unsaturated and saturated zones below the land surface. Included by some, but excluded by others, is water in the atmosphere, which includes water vapour, clouds, and all forms of precipitation while still in the atmosphere. Water moves through the hydrosphere in a cycle. Water collects in clouds, then falls to Earth in the form of rain or snow. This water collects in rivers, lakes and oceans. Then it evaporates into the atmosphere to start the cycle all over again. This is called the water cycle.

Scratch Brainstorming

Your task is to create an efficient code (the shortest code possible) in the *Climate Change Carbon Cycle Terminology Example* Scratch program that will continue the current pattern with the remaining Climate Change terminology.