

Knowledge Template

Group: Name Surname, Name Surname

Element

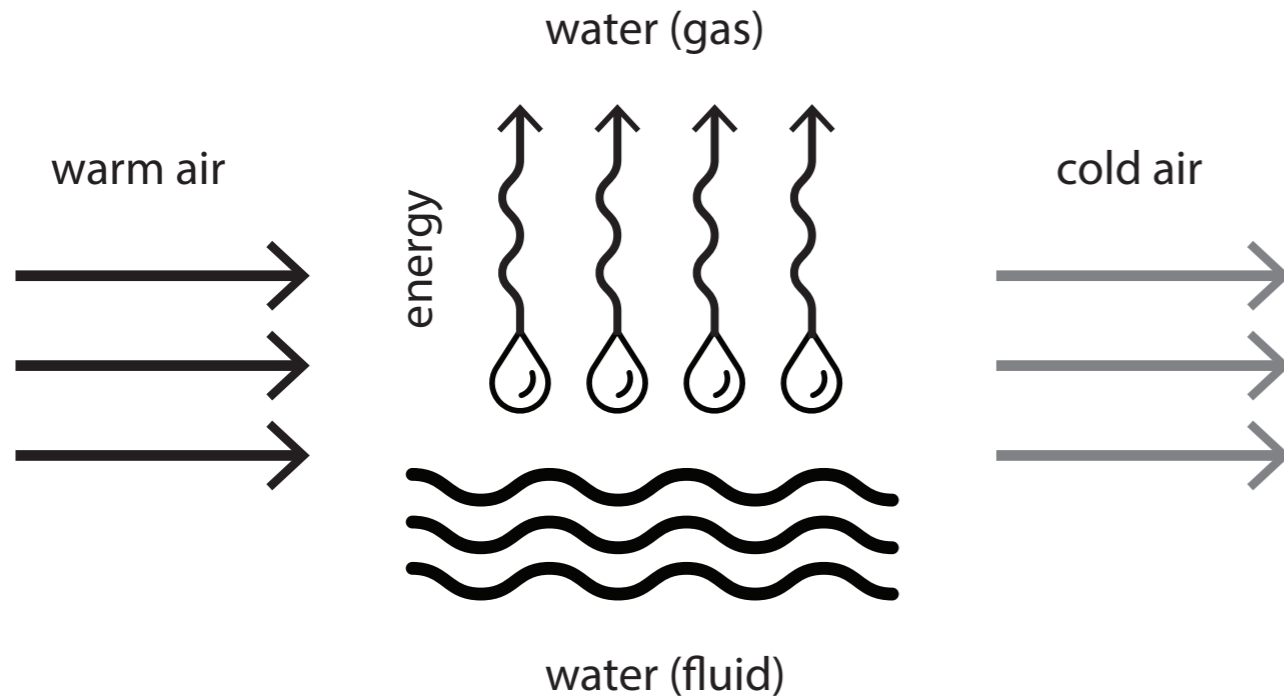
Water

Phenomena

Adiabatic / Evaporative Cooling

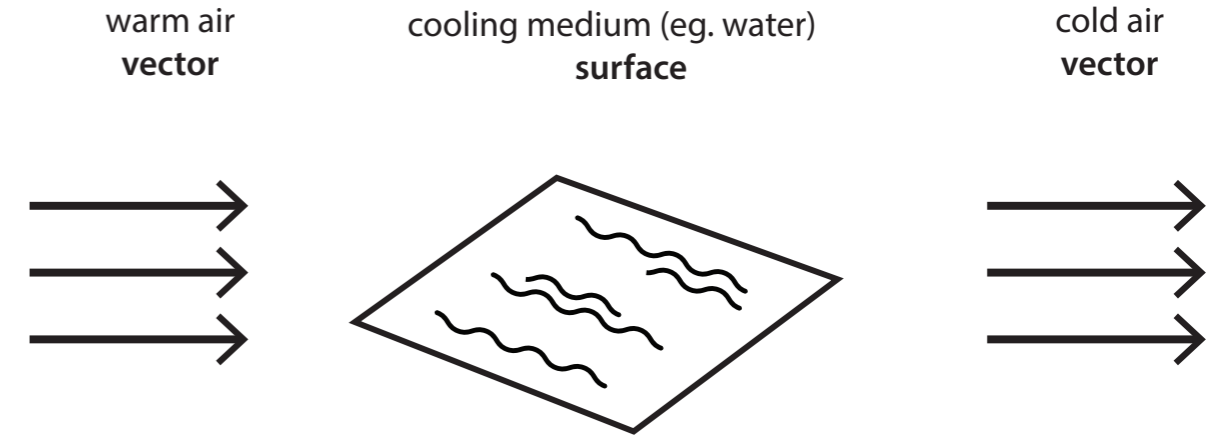
Description

Evaporative cooling is the process by which air temperature is reduced through the evaporation of water within an airstream. During evaporation, water needs the latent heat of vaporization, which is obtained from ambient air and decreased air temperature (Shukla, 2008).



The heat exchange between the air and cooling medium can be direct or indirect. Direct evaporative cooling systems rely on the direct channeling of water into the airflow, while in indirect systems the primary air is cooled but no moisture is added into the air, which can play an important role in building air-conditioning systems. The disadvantage of indirect evaporative cooling technology lies in its high dependency on ambient air conditions.

Formalized Process

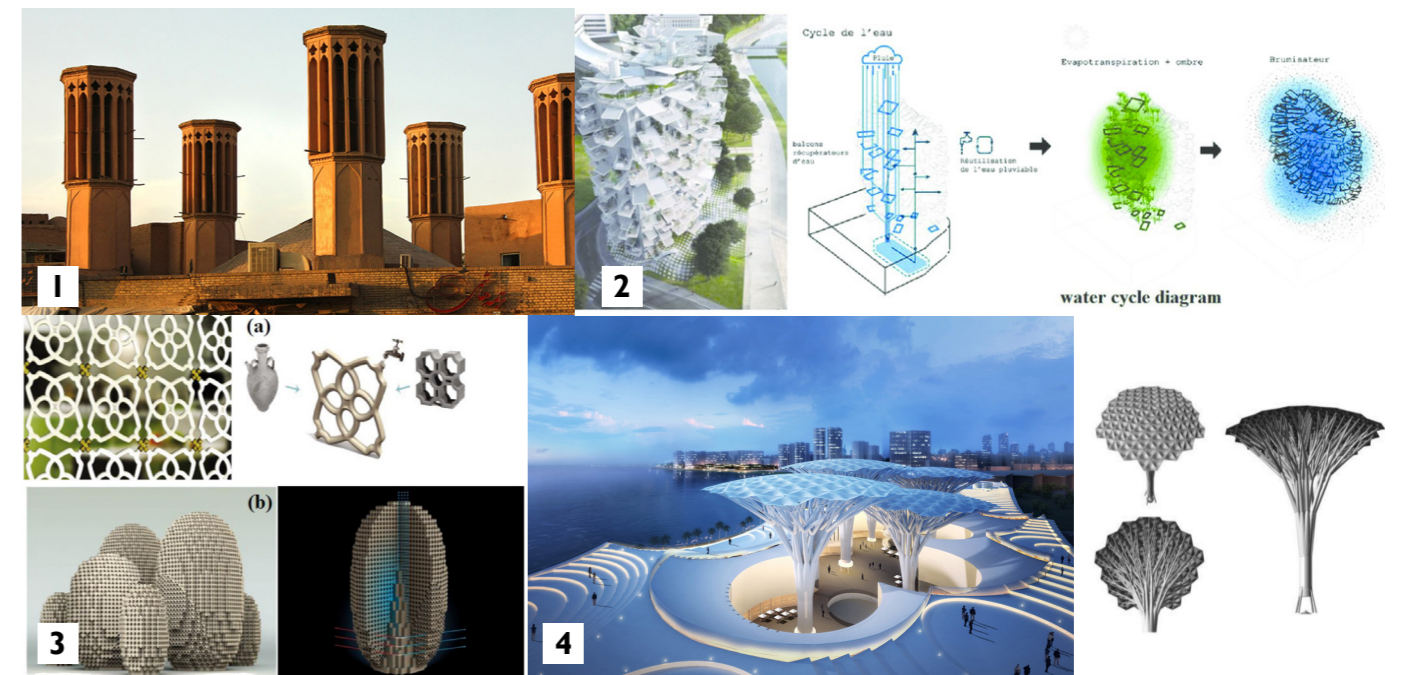


relevant parameters

direction
amplitude
temperature/
humidity

temperature
surface area (maximize)

Possible Applications



1; Windcatcher: a traditional architectural element used to create natural ventilation and passive cooling in buildings., 2; L'Arbre Blanc nature-inspired tower and its water cycle diagram (photo credit: Sou Fujimoto Architects, Nicolas Laisne Associes, and Manal Rachdi OXO Architects), 3; (a) E-cooler and (b) 3D printed pods concepts (photo credit: Andrew Michler), 4; Tree-shaped canopy design (photo credit: Iñaki Ábalos and Renata Sentkiewicz),