

Épreuve de DNL Anglais Physique-Chimie

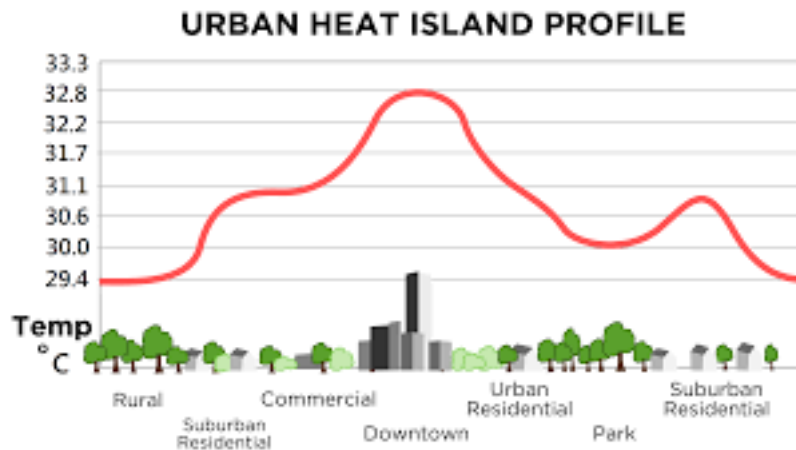
Sujet n°1 – Série S

Durée de l'épreuve : 40 minutes

- 20 minutes de préparation
- 10 minutes de présentation et 10 minutes d'échange avec le jury

Reducing Global warming

Document 1: Urban Heat Island

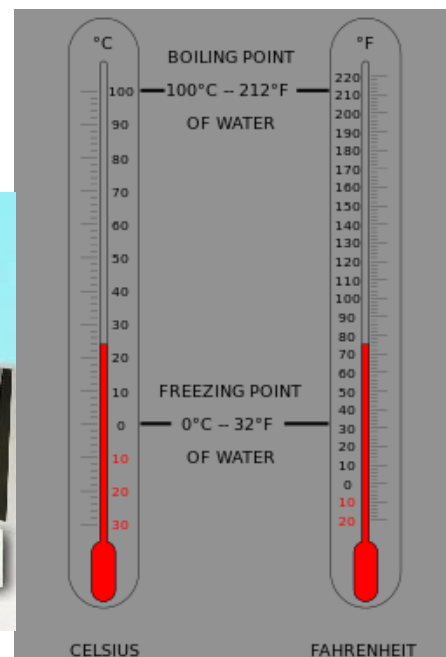


The term "heat island" describes built up areas that are hotter than nearby rural areas. The annual mean air temperature of a city with 1 million people or more can be 1.8–5.4°F (1–3°C) warmer than its surroundings. In the evening, the difference can be as high as 22°F (12°C). Heat islands can affect communities by increasing summertime peak energy demand, air conditioning costs, air pollution and greenhouse gas emissions, heat-related illness and mortality, and water quality.

Many communities are taking action to reduce urban heat islands using [cooling] strategies : 1) increasing tree and vegetative cover, 2) installing green roofs, 3) installing cool—mainly reflective—roofs, 4) using cool pavements (either reflective or permeable) [...].

<https://www.epa.gov/heat-islands/heat-island-cooling-strategies>
<http://www.lcs.org.pk/understanding-the-urban-heat-island-effect/>

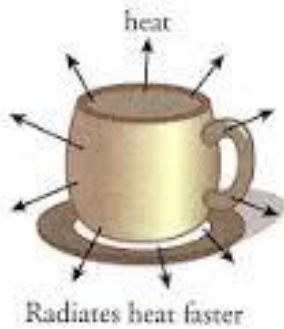
Document 2: Cool roofs - Watch the video (2'16)



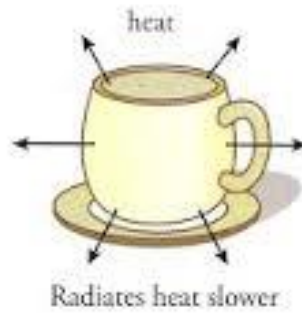
Document 3: Heat Energy transfer

Infra red radiation is an electromagnetic radiation. For this reason it can travel through a vacuum. This shows that radiation unlike conduction and convection does not require particles for its propagation. It is for this reason we can receive heat energy from the sun. Heat is a mode of transfer of energy from a body at a higher temperature to a body at a lower temperature. Dark, matt (dull) surfaces absorb and emit Infra-red radiation at a faster rate than light, shiny (smooth) surfaces.

Black cup



White cup



[400 x 153 - limiyin-physicsproject2009.blogspot.com](http://400x153-limiyin-physicsproject2009.blogspot.com)

Tasks:

- Present these documents.
- Energy can be stored and transferred. It cannot be created or destroyed. Heat flows spontaneously from a hot to a cold body. Which energy transfer is mainly involved in this video? Explain and illustrate this phenomenon in our daily life.
- There are some concerns raised about possible contribution from urban heat islands to global warming. Explain why cool roofs could help to reduce energy consumption.
- Discuss how useless or useful the 'cool roof' could be in Normandy as if you were an architect. Are there any other solutions you can imagine to help reduce the global warming issue ?