

Answers to GCSE Physics of a Heatwave Questions

1. Radiation.
2. Radiation can travel through a vacuum, so it does not need particles.
3. The black car gets hotter because it absorbs more infrared radiation.
4. Light-coloured clothes reflect more radiation and absorb less energy.
5. The average kinetic energy of the air particles increases.
6. Hot air expands, becomes less dense, and rises.
7. Warm air above the road expands, rises, and cooler air moves in to replace it.
8. Metal conducts thermal energy to your hand faster than plastic.
9. Sweat evaporates, taking energy from the skin and cooling the body.
10. A fan helps sweat evaporate faster, so more energy leaves the skin.
11. Roads and buildings store thermal energy during the day and release it at night.
12. Rails expand when heated, so gaps stop them buckling.
13. Gas particles move faster and collide harder with the can, increasing pressure.
14. Loft insulation reduces energy transfer through the roof.
15. White surfaces reflect more radiation and absorb less energy.
16. $c = E \div m\Delta\theta = 1840 \div (0.8 \times 10) = 230 \text{ J/kg}^\circ\text{C}.$
17. $E = mc\Delta\theta = 200 \times 4200 \times 3 = 2,520,000 \text{ J}.$
18. $E = Pt = 1.2 \times 5 = 6 \text{ kWh}.$
19. $\text{cost} = 6 \times 30\text{p} = 180\text{p} = \text{£}1.80.$
20. More air conditioners increase electricity demand, which can release more carbon dioxide if fossil fuels are used.