

# GCSE Physics of a Heatwave

## Questions

1. The Sun heats the Earth during a heatwave. Name the main method of energy transfer from the Sun to the Earth.
2. Explain why energy from the Sun can reach Earth even though space is a vacuum.
3. A black car and a white car are parked in the same sunny car park. Which car is likely to get hotter? Explain your answer using the word radiation.
4. Explain why wearing light-coloured clothes can help keep a person cooler during a heatwave.
5. During a heatwave, the temperature of the air increases. What happens to the average kinetic energy of the air particles?
6. Explain why hot air is less dense than cooler air.
7. A road surface becomes very hot in the Sun. Describe how convection currents can form in the air above the road.
8. A metal playground slide and a plastic slide are both in direct sunlight. Explain why the metal slide may feel hotter when touched.
9. A person sweats more during a heatwave. Explain how evaporation of sweat helps cool the body.
10. A fan is used in a hot room. Explain why the fan makes a person feel cooler even though it does not reduce the temperature of the air.
11. At night, a city can stay warmer than the countryside. Explain why buildings, roads and pavements can continue to warm the air after sunset.
12. Explain why railway tracks need gaps between sections of metal rail, especially during very hot weather.
13. A sealed aerosol can is left in a hot car. Explain why this can be dangerous using ideas about gas particles and pressure.
14. A house has thick loft insulation. Explain how this can help keep the house cooler during a heatwave.
15. Some buildings are painted white in hot countries. Explain how this reduces the energy transferred to the building.

16. A 0.8 kg metal pan is left in the Sun. It absorbs 1840 J of energy and its temperature rises by 10 °C. Calculate the specific heat capacity of the metal.
17. A garden pond contains 200 kg of water. The specific heat capacity of water is 4200 J/kg°C. Calculate the energy needed to increase the temperature of the pond water by 3 °C.
18. An air conditioner has a power rating of 1.2 kW. It is used for 5 hours during a heatwave. Calculate the energy transferred in kWh.
19. Electricity costs 30p per kWh. Calculate the cost of using the 1.2 kW air conditioner for 5 hours.
20. During heatwaves, many people use air conditioners at the same time. Explain how this could increase electricity demand, increase carbon dioxide emissions, and contribute to the enhanced greenhouse effect.