

GCSE Physics Questions on The Physics of an Air Fryer

Air fryers use many of the ideas you study in GCSE Physics, including electrical power, energy transfers, resistance, convection and efficiency. By answering these questions, you will see how physics helps explain the operation of a common household appliance. Show all your working for calculation questions and use scientific vocabulary in your explanations.

1. What is the main energy transfer that takes place in an air fryer?
2. Name the type of current supplied by the mains electricity used by an air fryer.
3. Explain why the heating element in an air fryer gets hot.
4. What type of heat transfer is caused by the fan moving hot air around the food?
5. What type of electromagnetic radiation is emitted by the heating element?
6. An air fryer has a power rating of 1800 W and operates from a 230 V supply. Calculate the current drawn by the air fryer.
7. An air fryer draws a current of 8.0 A from a 230 V supply. Calculate its power.
8. An air fryer transfers 540000 J of energy while cooking food. Calculate the cooking time if its power is 1800 W.
9. The heating element has a resistance of 25Ω and a current of 8.0 A flows through it. Calculate the power dissipated by the element.
10. A heating element transfers 2000 W of power and has a resistance of 20Ω . Calculate the current flowing through it.
11. Explain why air fryers often cook food more quickly than conventional ovens.
12. An air fryer is used for 15 minutes and has a power rating of 1500 W. Calculate the energy transferred in **Joules (J)**.
13. A student says, "Energy is created inside the air fryer." Explain why this statement is incorrect.

14. An air fryer is 80% efficient. It transfers 1600 J of useful thermal energy to the food each second. Calculate the total energy supplied each second.
15. Describe how convection currents are set up inside an air fryer.
16. Explain why the heating element is made from a material with a high resistance.
17. An air fryer operates for 20 minutes at a power of 1800 W. Calculate:
 - a) The energy transferred in Joules (J).
 - b) The energy transferred in kilojoules (kJ).
 - c) The energy transferred in kilowatt-hours (kWh).