

Fuels, nuclear power, renewables and the climate

Grade 8 science (Year 9 · Class 8) · Test

Name: _____ Date: _____ Class: _____ Mark: ____ / 20

This test covers energy resources, power stations, efficiency, energy calculations and climate change. Answer all the questions, show your working for calculations and include units.

Level: Grade 8 science (Year 9 · Class 8) · **Curriculum:** MS-ESS3-3

Time: 45 minutes · 8 questions · Total: 20 marks · Calculator allowed

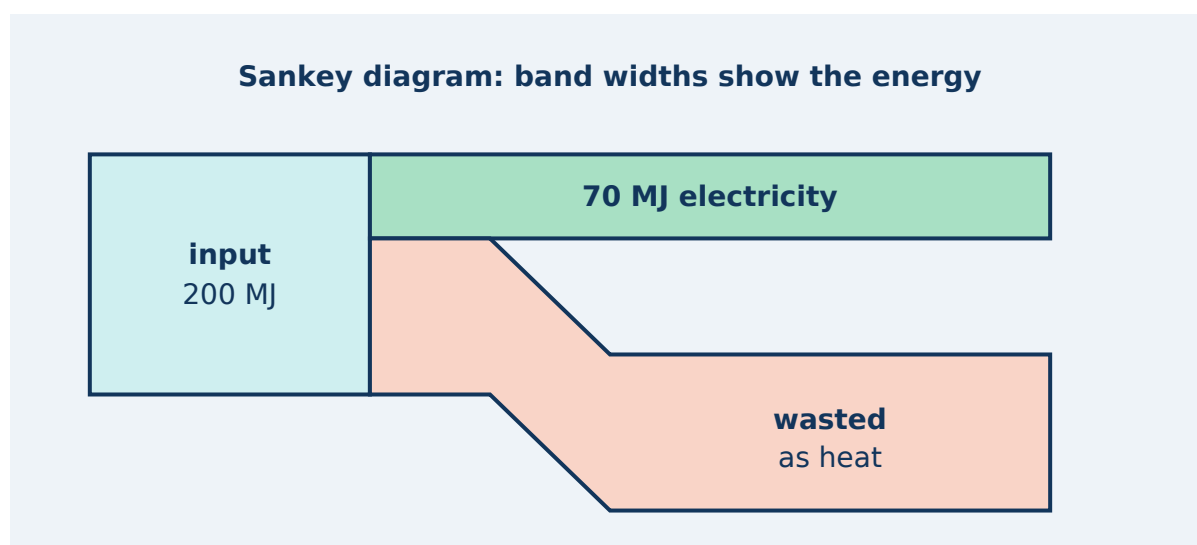
Question 1 Renewable resources (2 marks)

- State what is meant by a renewable energy resource. (1 mark)
- Give one example. (1 mark)

Question 2 Power station Sankey diagram (3 marks)

The Sankey diagram shows a power station with an input of 200 MJ and a useful output of 70 MJ.

- Calculate the wasted energy. (1 mark)
- Calculate the efficiency as a percentage. (2 marks)



A Sankey diagram for a power station.

Question 3 Burning coal and the climate (3 marks)

Explain how burning coal in power stations contributes to global warming. (3 marks)

Question 4 Nuclear power (2 marks)

- State one advantage of nuclear power over coal. (1 mark)
- State one disadvantage of nuclear power. (1 mark)

Question 5 Solar farm energy (3 marks)

A solar farm delivers 4.0 MW for 6.0 hours.

- Calculate the energy delivered in MWh. (2 marks)
- Convert your answer to kWh. (1 mark)

Question 6 Reliability of wind power (2 marks)

Explain why a country cannot rely on wind power alone, and suggest one way to solve the problem. (2 marks)

Question 7 Hydroelectric energy (3 marks)

Water of mass 2.0×10^4 kg falls through a height of 50 m. Use $g = 9.8$ N/kg. Calculate the gravitational potential energy lost by the water. (3 marks)

Question 8 Reducing emissions (2 marks)

Suggest two ways a family can reduce the CO₂ emissions linked to its energy use. (2 marks)