

**GCSE Physics B (Twenty First Century Science)**  
**J259/04** Depth in physics (Higher Tier)

**Question Set 27**

1

Water can be used as a coolant to stop over-heating in systems such as car engines.

Jane does an experiment to find the specific heat capacity of water.

**Jane**  
I can measure the specific heat capacity of water by timing how long a 1900 W kettle takes to boil 1 kg of water.



- (a) (i) Give **one** reason why Jane's result for the specific heat capacity of water will be inaccurate. [1]
- (ii) Suggest **one** improvement to Jane's experiment, to get a more accurate value for the specific heat capacity of water. [1]

- (b) It takes the kettle 3 minutes to heat 1 kg of water to 100 °C from a starting temperature of 20 °C.

Calculate the specific heat capacity of water.

Use the equation:

change in internal energy = mass × specific heat capacity × temperature change

Use the equation:

energy transferred = power × time

- Specific heat capacity = ..... J/kg °C [4]
- (c) When water is heated in a kettle, the energy stored within the water changes. [4]
- Describe how heating water in the kettle to boiling point changes the energy stored within the water. [3]

**Total Marks for Question Set 27: 9**

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