

Why some changes heat up and others cool

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

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

This test lasts 45 minutes and is worth 20 marks. Use $c = 4.2 \text{ J/(g } ^\circ\text{C)}$ for water. Show the formula and substitution in calculations, give units, and write complete sentences in the explanations.

Level: Grade 8 science (Year 9 · Class 8) · **Curriculum:** MS-PS1-6

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

Question 1 Definitions (2 marks)

- Define an endothermic reaction. (1 mark)
- Give one everyday example. (1 mark)

Question 2 Classify (2 marks)

- State whether burning methane in a Bunsen burner is exothermic or endothermic. (1 mark)
- State whether dissolving ammonium nitrate in water is exothermic or endothermic. (1 mark)

Question 3 Temperature change (3 marks)

A mixture goes from 18.5°C to 27.0°C .

- Calculate ΔT . (1 mark)
- State the type of reaction and give a reason. (2 marks)

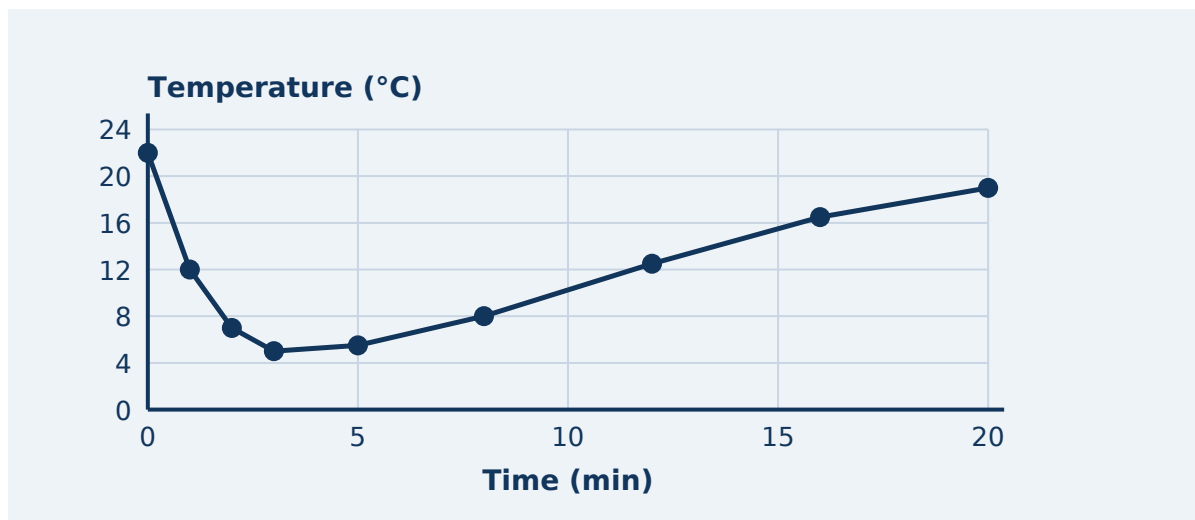
Question 4 Energy calculation (3 marks)

Use $c = 4.2 \text{ J/(g } ^\circ\text{C)}$. A reaction warms 80 g of water by 7.5°C .

- Calculate the energy gained by the water. (2 marks)
- The same energy warms 160 g of water. Calculate the temperature rise. (1 mark)

Question 5 Cold pack graph (3 marks)

The graph shows the temperature of an instant cold pack.



Temperature of an instant cold pack.

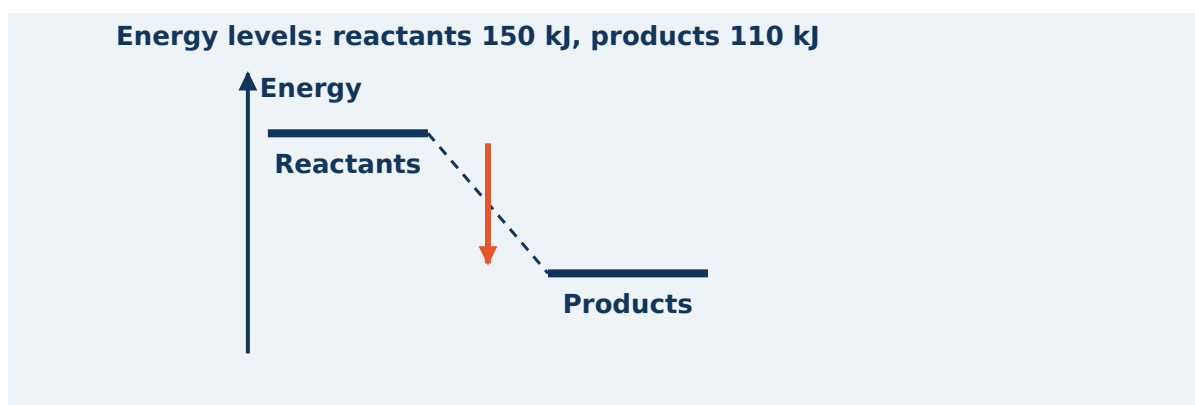
- State the lowest temperature reached. (1 mark)
- Calculate the fall from the start. (1 mark)
- Explain why the temperature rises later. (1 mark)

Question 6 How a hand warmer works (3 marks)

- Explain why a hand warmer gets warm and later stops. (3 marks)

Question 7 Energy diagram (2 marks)

The diagram shows energy levels for a reaction.



Energy levels for a reaction.

- State whether the reaction is exothermic or endothermic. (1 mark)
- Calculate the energy transferred in kJ. (1 mark)

Question 8 Correct the idea (2 marks)

- a. A player says 'a cold pack puts cold into my knee'. Explain what really happens. (2 marks)