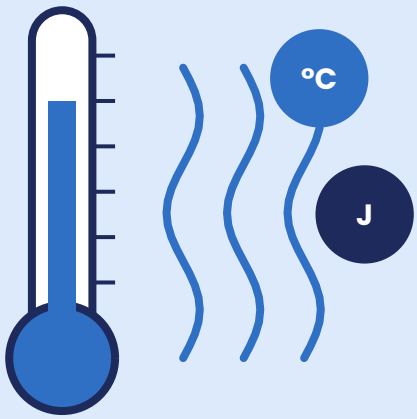
YOUR SCIENCE ONLINE
yourscienceonline.com

Year 8 • KS3 Physics

Heat Transfer

Homework Worksheet

Practise conduction, convection, radiation and insulation, with a cooling investigation and graph.



Temperature | Conduction | Convection | Radiation | Insulation | Cooling

KEY IDEAS IN THIS WORKSHEET **YEAR 8**

Name: _____ Class: _____

Date set: _____ Date due: _____

What's inside

Section A	Key ideas	**8 marks**
Section B	Conduction, convection and radiation	**17 marks**
Section C	Applications of heat transfer	**10 marks**
Section D	Data and investigation	**15 marks**

Instructions

- Answer all questions in the spaces provided.
- Show your working in calculations.
- Marks for each question are shown in [ ].
- Use the word boxes and diagrams to help you.

Total score

/ 50

© Your Science Online • yourscienceonline.com • For personal and single-classroom use only. Please do not share or resell.

Heat Transfer Worksheet

Year 8 • KS3 Physics • Conduction, convection, radiation and insulation. Show your working in calculations.

Section A — Key ideas [8 marks]

Word box hot | cold | joules | vibrate | degrees Celsius | thermometer

1 Use words from the box to complete the sentences.

(a) Thermal energy always moves from a ..... object to a ..... object. **[2]**

(b) Temperature is measured in ..... using a ..... . **[2]**

(c) Energy is measured in ..... . **[1]**

(d) When a solid is heated, its particles ..... faster. **[1]**

2 Explain the difference between heat (thermal energy) and temperature. **[2]**

.....

.....

.....

Section B — Conduction, convection and radiation [17 marks]

3 Complete the table. **[6]**

Method	Where it mainly happens	How the energy is transferred
Conduction		
Convection		
Radiation		

4 Name the main method of heat transfer in each example. **[4]**

Example	Conduction, convection or radiation?
Feeling warm in front of a fire without touching it	
A metal spoon in hot soup gets hot	
A radiator heats the air in a room	
The Sun warms the Earth	

5 Explain how thermal energy travels through a metal rod when one end is heated. **[3]**

.....

.....

.....

6 Water in a beaker is heated from below. Explain how a convection current forms. **[3]**

.....

.....

.....

7 Explain why convection cannot happen in a solid. **[1]**

.....

Section C Applications of heat transfer [10 marks]

8 Explain how a vacuum flask keeps hot drinks hot. Use the ideas of conduction, convection and radiation. **[4]**

.....

.....

.....

.....

9 Houses are insulated with fibreglass in the loft. Explain how this reduces heat loss. **[2]**

.....

.....

10 People in hot countries often paint roofs white. Explain why. **[2]**

.....

.....

11 The heating element in an electric kettle is at the bottom. Explain why this is a good place for it. **[2]**

.....

.....

Section D Data and investigation [15 marks]

12 A student fills three identical beakers with 200 cm^3 of water at 90 °C. One is wrapped in foil, one in wool and one is left bare. The temperature is recorded every 2 minutes.

Time (min)	0	2	4	6	8	10
Bare beaker (°C)	90	82	75	69	64	60
Foil-wrapped (°C)	90	86	83	80	77	75
Wool-wrapped (°C)	90	88	86	84	82	80

(a) Calculate the temperature drop after 10 minutes for each beaker. **[3]**

bare = ... °C foil = ... °C wool = ... °C

(b) Which material is the best insulator? Give a reason. **[1]**

.....

(c) Calculate the average rate of cooling of the bare beaker in °C per minute. **[2]**

.....

rate = ... °C per minute

(d) Give **two** variables the student must keep the same. **[2]**

.....

.....

(e) Suggest why a lid could be added to each beaker. **[1]**

.....

13 Plot a line graph of the results for the **bare beaker only** on the grid. Label both axes with units. **[3]**

14 **Challenge.** On a cold day a metal bench feels colder than a wooden bench, although both are at the same temperature. Explain why. **[3]**

.....

.....

.....

END OF WORKSHEET **Total: _____ / 50**