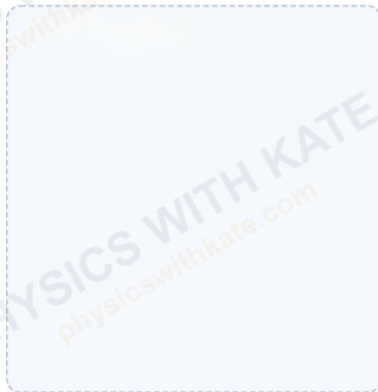


Conduction, Convection and Radiation

Edexcel International GCSE Physics · Energy

Conduction *in solids*

Draw a diagram



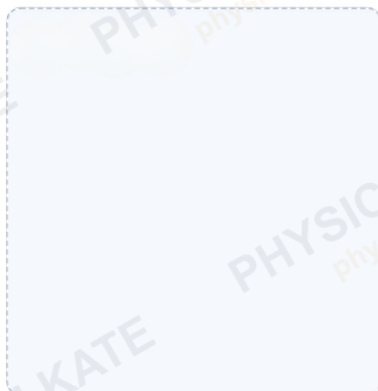
Explain how energy is transferred through a solid by conduction.

Key words to use

- ☐ vibrating molecules
- ☐ collide
- ☐ vibrate more
- ☐ energy transfer

Convection *in liquids & gases*

Draw a diagram



Explain how a convection current is set up.

Key words to use

- ☐ air particles gain KE
- ☐ move further apart
- ☐ hot air is less dense and rises
- ☐ energy is transferred upwards
- ☐ cooler, more dense air replaces it
- ☐ convection current

Radiation *infrared*

Draw a diagram



Explain energy transfer by (infrared) radiation.

Key words to use

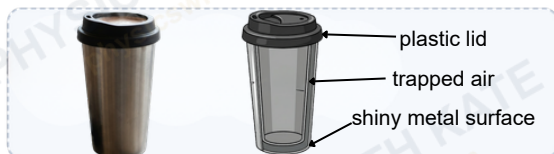
- ☐ black / matt surface
- ☐ colder object: good absorber of radiation → higher temperature
- ☐ hotter object: good emitter of radiation → lower temperature
- ☐ energy transferred by radiation

Explaining Conduction, Convection and Radiation

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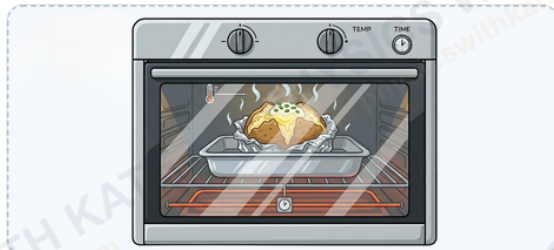
1

Priya buys a hot chocolate in a takeaway cup. The cup has a plastic lid, a double wall with a gap of trapped air between the layers, and a shiny silver outer surface. The photograph and cross-section diagram both show the cup. Explain how the design of the cup keeps the drink hot. Refer to the methods of energy transfer in your answer. [6 marks]



2

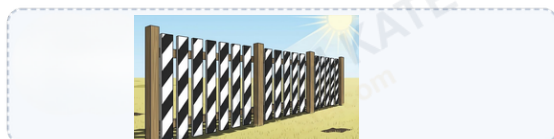
Sam is baking a large jacket potato in an oven. The oven transfers thermal energy to the outer surface of the potato. Explain how thermal energy is transferred to the centre of the potato. [3 marks]



3

A wooden fence rail is painted with alternating matt black and shiny silver stripes. On a sunny day the rail is warmed by the Sun.

- Explain which stripes reach the highest temperature. [2 marks]
- Explain how a convection current forms in the air just above the warm rail. [4 marks]



Your challenge: keep the largest mass of ice cube by the end of the session.

Mass of ice at the start = g

Materials I will use:

Sketch your design:

Conduction *in solids*

Explain how your design reduces energy transfer by conduction.

KEY WORDS TO USE (OR THE NEGATIVE VERSION)

- ☐ vibrating molecules
- ☐ collide
- ☐ vibrate more
- ☐ energy transfer

Convection *in liquids & gases*

Explain how your design reduces energy transfer by convection.

KEY WORDS TO USE (OR THE NEGATIVE VERSION)

- ☐ air particles gain KE
- ☐ move further apart
- ☐ hot air is less dense and rises
- ☐ energy is transferred upwards
- ☐ cooler, more dense air replaces it
- ☐ convection current

Radiation *infrared*

Explain how your design reduces energy transfer by radiation.

KEY WORDS TO USE (OR THE NEGATIVE VERSION)

- ☐ black / matt surface
- ☐ colder object: good absorber of radiation → higher temperature
- ☐ shiny / white surface poor absorber of radiation
- ☐ hotter object: good emitter of radiation → lower temperature
- ☐ energy transferred by radiation

Mass of ice at the end = g

Mass of ice melted (start – end) = g