

HEAT TRANSFER AND INSULATION

Key Concepts

- Heat transfers through conduction, convection, and radiation.
- Insulation reduces heat transfer.



Key Facts to Remember

- Conduction occurs in solids when particles vibrate and pass energy to neighbors.
- Metals are good conductors; materials like wood and plastic are insulators.
- Convection occurs in fluids (liquids and gases) when warmer areas rise and cooler areas sink.
- Radiation transfers heat as infrared waves and does not require a medium.
- Dark, matte surfaces absorb and emit heat well, while shiny surfaces reflect it.
- Insulators like foam and wool trap air, reducing heat transfer.
- Heat always flows from hot to cold objects.
- The effectiveness of insulation is measured by its thermal conductivity; lower is better.

Quick Questions

1. Name the three types of heat transfer.
2. How does conduction occur?
3. What materials are good conductors?
4. What happens during convection?
5. Can radiation occur in a vacuum?
6. Which surfaces absorb heat best?
7. Why are insulators effective?
8. In what direction does heat flow?

Fun Fact

Penguins huddle together to reduce heat loss, creating their own insulating "heat bubble"!