Conduction Quiz Answer Key PDF

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Compare and contrast conduction with radiation as methods of heat transfer.

A. Conduction requires direct contact. ✓

C. Radiation requires a medium.

D. Conduction occurs through electromagnetic waves.

C. Radiation transfers energy without a medium. ✓

In which state of matter does conduction primarily occur?

A. Plasma

C. Gas

D. Solid ✓

C. Liquid

What unit is thermal conductivity measured in?

A. Joules

C. Amperes

D. Celsius

C. Watts per meter-kelvin (W/m·K) ✓

Which law mathematically describes heat conduction?

A. Newton's Law

C. Ohm's Law

D. Boyles's Law

C. Fourier’s Law ✓

Which of the following is an example of conduction in everyday life?

A. Sunlight warming the Earth
C. Boiling water circulating in a pot
D. Air currents in a room
C. A metal spoon getting hot in a cup of tea ✓

What is conduction?

A. Transfer of heat through a fluid
C. Direct transfer of heat or electricity through a substance ✓
D. Transfer of heat through a vacuum
C. Transfer of heat through electromagnetic waves

What is the primary mechanism of heat transfer in conduction?

A. Movement of fluid
C. Emission of radiation
D. Chemical reaction
C. Vibration of atoms and movement of electrons ✓

Which of the following materials is a good conductor of electricity?

A. Wood
C. Rubber
D. Glass
C. Copper ✓

Discuss the role of electron movement in electrical conduction.

A. Electrons move freely and create current. ✓
C. Electrons are fixed in place.
D. Electrons do not transfer energy.
C. Electrons only move in one direction.

How does the length and cross-sectional area of a conductor affect its efficiency?

A. Longer length increases efficiency.
C. Larger cross-sectional area reduces resistance. ✓

D. Shorter length reduces resistance. ✓
C. Cross-sectional area has no effect.

Explain how conduction occurs at the atomic level in metals.

A. Electrons move freely and transfer energy. ✓
C. Atoms vibrate without transferring energy.
D. Electrons are fixed in place.
C. Energy is transferred through radiation.

Describe a real-world scenario where conduction is the primary mode of heat transfer.

A. A metal rod being heated at one end. ✓
C. Air heating up in a room.
D. Water boiling in a pot.
C. Sunlight warming the Earth.

Why are metals generally better conductors than non-metals?

A. Metals have higher density.
C. Metals have free electrons. ✓
D. Non-metals have fixed electrons.
C. Metals are more malLEABLE.

Which of the following are applications of conduction? (Select all that apply)

A. Cooking with a metal pan ✓
C. Insulating a house with fiberglass
D. Using a copper wire for electrical wiring ✓
C. Solar panels converting sunlight to electricity

What factors increase the rate of conduction? (Select all that apply)

A. High thermal conductivity ✓
C. Small cross-sectional area
D. Short length of the conductor ✓

C. Large temperature gradient ✓

How does conduction differ from convection? (Select all that apply)

A. Conduction involves direct contact ✓
C. Convection involves fluid movement ✓
D. Conduction occurs in a vacuum
C. Convection does not require a medium

Which metals are known for high thermal conductivity? (Select all that apply)

A. Copper ✓
C. Aluminum ✓
D. Iron
C. Lead

Which material is typically used as an insulator due to poor conduction?

A. Silver
C. Copper
D. Aluminum
C. Rubber ✓

What are the characteristics of a good conductor? (Select all that apply)

A. High resistance
C. High thermal conductivity ✓
D. Free electrons ✓
C. Low density

Which materials are typically poor conductors of electricity? (Select all that apply)

A. Glass ✓
C. Rubber ✓
D. Silver
C. Plastic ✓