

40 Lecture - PHY101

Important Subjective

What is thermal expansion? Give an example of a material that shows significant thermal expansion.

Answer: Thermal expansion is the tendency of a substance to expand or contract in response to changes in temperature. An example of a material that shows significant thermal expansion is metal. Metals expand when heated and contract when cooled, which can cause problems in machinery and structures.

What is thermal conductivity? Explain how it is related to heat transfer.

Answer: Thermal conductivity is the ability of a material to conduct heat. It is related to heat transfer in that materials with higher thermal conductivity transfer heat more easily than materials with lower thermal conductivity. This is because materials with higher thermal conductivity allow heat to flow through them more easily.

What is the difference between specific heat and heat capacity?

Answer: Specific heat is the amount of heat required to raise the temperature of one gram of a substance by one degree Celsius. Heat capacity, on the other hand, is the amount of heat required to raise the temperature of an entire object by one degree Celsius. Heat capacity is therefore dependent on the mass of the object, while specific heat is not.

What is convection? Give an example of convection in action.

Answer: Convection is the transfer of heat through the movement of fluids. An example of convection in action is the heating of a room through a radiator. The warm air rises from the radiator and is replaced by cooler air, creating a cycle of hot and cold air that circulates through the room.

What is the greenhouse effect? How does it relate to heat transfer?

Answer: The greenhouse effect is the process by which certain gases in the Earth's atmosphere trap heat, causing the Earth's surface to become warmer. This is similar to how a greenhouse works, as it traps heat inside to keep plants warm. The greenhouse effect relates to heat transfer because it involves the transfer of heat from the Earth's surface to the atmosphere.

What is the difference between a conductor and an insulator?

Answer: A conductor is a material that easily conducts heat, while an insulator is a material that does not conduct heat well. This means that conductors allow heat to flow through them easily, while insulators resist

the flow of heat.

What is a thermocouple? How is it used to measure temperature?

Answer: A thermocouple is a device that measures temperature by producing a voltage proportional to the temperature difference between two points. It consists of two wires made of different metals that are joined at one end. When the joined end is exposed to heat, it produces a voltage that can be measured to determine the temperature.

What is the difference between conduction, convection, and radiation?

Answer: Conduction is the transfer of heat through direct contact between two objects. Convection is the transfer of heat through the movement of fluids. Radiation is the transfer of heat through electromagnetic waves.

What is the first law of thermodynamics?

Answer: The first law of thermodynamics, also known as the law of conservation of energy, states that energy cannot be created or destroyed, only transferred or converted from one form to another.

What is an adiabatic process?

Answer: An adiabatic process is a process in which no heat is exchanged between the system and its surroundings. This means that the temperature of the system changes without any input or output of heat. An example of an adiabatic process is the compression or expansion of a gas in a closed container.