



THERMAL ENERGY

EDITABLE student notebook pages - digital links included for students to complete guided notes on Google Drive

Question: How are conduction and convection different?

TRANSFERRING THERMAL ENERGY

Thermal energy is transferred from place to place by:

CONDUCTION

transfer of thermal energy by collisions between particles in matter

CONVECTION

transfer of thermal energy in a fluid by the movement of warmer and cooler fluid from place to place

RADIATION

transfer of energy by electromagnetic waves

Conduction occurs in solids, liquids, and gases. Thermal energy is transferred from place to place by collisions between particles in matter.

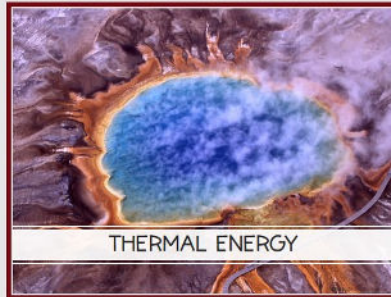
Convection occurs in fluids. Rising of warmer fluid and sinking of cooler fluid forms a convection current.

The transfer of energy by radiation is most important in space.

Insulator - material in which heat flows slowly

Examples of materials that are insulators

Fiber glass and air



THERMAL ENERGY



Temperature And Heat

Heat

thermal energy that flows from something at a higher temperature to something at a lower temp.

Specific heat

amount of heat needed to raise the temp of 1 kg of some material by 1°C

Thermal Energy Equation
 $(Q) \text{ Change in thermal energy (J)} = \text{Mass (kg)} \times \Delta \text{ temp (}^\circ\text{C)} \times (c) \text{ Specific heat (J/kg}^\circ\text{C)}$

Temperature

A measure of the average value of the kinetic energy of the molecules in random motion. (SI Unit for temperature is Kelvin (K)).

Thermal expansion

Almost all substances expand when they are heated and contract when they are cooled - exception water

Thermal energy

Sum of the kinetic and potential energy of all the particles in an object; thermal energy of an object increases as temperature increases

Temperature Conversion Equations

$$^\circ\text{C} = (5/9)(^\circ\text{F} - 32)$$

$$^\circ\text{F} = (9/5)(^\circ\text{C}) + 32$$

EDITABLE PowerPoint presentations include high-resolution graphics and feature all topics and vocabulary covered in the notes

Thermal energy is transferred from place to place by:

Conduction

transfer of thermal energy by collisions between particles in matter

Convection

transfer of thermal energy in a fluid by the movement of warmer and cooler fluid from place to place

Radiation

transfer of energy by electromagnetic waves

Conduction occurs in solids, liquids, and gases. Metals are the best conductors of heat

Convection

Occurs in fluids. Rising of warmer fluid and sinking of cooler fluid forms a convection current

Two types of systems that use Sun's energy:



Active Solar heating

Systems that use solar collectors that absorb radiant energy from sun

Passive Solar heating

Radiant energy from the sun is transferred to the room through windows

Name _____ Date _____

CHAPTER TEST: The

Multiple Choice

Choose the answer that best completes each statement.

1. The total energy of all the particles in a substance is called _____.
a. temperature
b. thermal energy
c. degrees
d. mass
2. The most common method of heat transfer in liquids and gases is _____.
a. heat
b. convection
c. radiation
d. conduction
3. Heat is transferred from a warmer object to a cooler object by _____.
a. conduction
b. convection
c. radiation
d. all of these
4. Heat is transferred from a warmer object to a cooler object by _____.
a. conduction
b. convection
c. radiation
d. all of these
5. The transfer of heat by the movement of a liquid or gas is called _____.
a. conduction
b. convection
c. radiation
d. all of these
6. Heat is transferred from a warmer object to a cooler object by _____.
a. conduction
b. convection
c. radiation
d. all of these
7. A material that does not allow heat to pass through it easily is called _____.
a. insulator
b. conductor
c. reflector
d. radiator

Continued

EDITABLE Chapter test includes multiple choice, fill in the blank, interpreting diagrams, & short Answers questions

- a. conduction
b. convection
c. radiation
d. insulation

17. Which of these is a good conductor?

- a. wood
b. paper
c. silver
d. air

18. A measure of the average kinetic energy of the individual particles in an object is called ____.

- a. thermal energy
b. conduction
c. convection
d. Temperature

Complete each statement with the correct word.

19. During _____, heat is transferred from a warmer object to a cooler object by the movement of a liquid or gas.

20. Trapped air is a good _____ of heat.

21. As most substances _____, they expand.

22. The SI unit of heat is the _____.

23. The handle of a metal spoon is a good _____ of heat.

24. The sun transfers heat to Earth by _____.

25. Fiberglass is a good _____ of heat.

26. When something is heated, it _____.

27. A thermometer is used to measure _____.

Continued

Interpreting Diagrams

Use the diagram to answer each question.



28. For what purpose is this type of window used?

29. What physical process is reduced by the device shown?

30. What purpose do you think the air space serves?

31. Many older windows have only a single pane. Why do these windows not insulate very well?

Continued

©2000 Pearson Education, Inc.

Answer key included – Images are blurred for copyright reasons



Thank you for sharing NGS Magnified with your students!

Terms of Use

Copyright © NGS Magnified, LLC (formerly Nitty Gritty Science, LLC.) All rights reserved by author Dr. Erica Colón. This product is to be used by the original downloader only. Copying for more than one teacher, classroom, department, school, or school system is prohibited. This product may not be distributed or displayed digitally for public view. Failure to comply is a copyright infringement and a violation of the Digital Millennium Copyright Act (DMCA). Clipart and elements found in this PDF are copyrighted and cannot be extracted and used outside of this file without permission or license. Intended for classroom and personal use ONLY.

Contact Information:

Email: admin@nittygrittyscience.com

Website: www.NGSmagnified.com

TPT: <https://www.teacherspayteachers.com/Store/Nitty-Gritty-Science>

