Conduction, Convection, or Radiation?

Summary

Students will identify examples of three types of heat transfer.

Time Frame

1 class periods of 45 minutes each

Group Size

Small Groups

Life Skills

Communication

Materials

Book 'The Hottest Boy Who Ever Lived' by Anna Fienberg; Overhead or chart of heat transfer examples listed in step 3; Science Journals or paper for students

Background for Teachers

Heat is transferred by conduction, convection, and radiation. Conduction is heat transfer by direct contact, like frying an egg. Convection is heat transfer by the movement of gases or liquids, like most home furnaces, clothes dryers, or car heaters. Radiation is the transfer of heat in waves through space, like the sun or a fire.

Intended Learning Outcomes

Use catagories to classify. Recognize the personal relevance of science in daily life. Respect the contributions of science to the quality of human life. Understand science concepts.

Instructional Procedures

Show students a blow dryer, curling iron, and some item that was baked in the oven (cookie or bread). Ask students what these items have in common. (The curling iron and blow dryer produce heat The cookie was baked with heat. They all have something to do with heat.) Write conduction, convection, and radiation on the board. Explain the three types of heat tranfer to the students. As a class, decide which item is an example of each type of heat transfer. (Blow dryer- convection, curling iron-conduction, cookie or bread-baked by radiation.) Read 'The Hottest Boy Who Ever Lived' to the class and have students record examples of heat transfer in their science journals. After reading the book, have students share the examples of heat transfer they found in the story. Make a list on the board. Show the overhead or chart of examples from the book listed below. Compare to the class generated list.

    Sunshine
    Inside he burned like a bonfire.
    When he sighed, the grass turned brown and smoked.
    Lava boils in the volcano and shoot Hector right out.
    Hector & Gilda shake hands. Gilda was warm for the first time in her life.
    He tells Gilda about the lava that glowed red.
    He melts the snow when he walks.
    He holds the child and breathes on her cheek, hands, and eyelids.

He dipped his hands into barrels of water, and soon the water boiled and popped.
The air warms.
Hector blew on some stones until they glowed red.
He toasted barley cakes on his palms.
He fried eggs on his shoulders.
He barbecued salmon fillets on his feet.
He roasted chestnuts in his hands.
He thawed chickens.
He hugged people until their toes tingled.
He boiled water.
He cleared snow from their doors.
He melted holes for fishing.
He heated animals barns.
Gilda and Minton curled up around Hector's heat to stay warm.

Have students number from 1-22 in their journals. In small groups, discuss and decide what type of heat transfer is taking place and write the type next to each number. Let them know that some examples might have more than one answer. Discuss answers as a class and label each type of transfer on the overhead. Have students discuss everday examples of each type of transfer in small groups. Generate a class list of everyday examples on the board.

Extensions

Create a bulletin board of the types of heat transfer by having students cut out pictures from store ads. Divide a bulletin board into thirds and label the sections: conduction, convection, and radiation. Have students place the pictures in the correct section. (Conduction- frying pans, curling irons, irons, pots and pans, stoves, etc. Convection- clothes dryers, convection ovens, food dehydrators, portable heaters, etc. Radiation- microwaves, ovens, etc.)

Assessment Plan

Have students divide a piece of paper into thirds and label the sections: conduction, convection, and radiation. Ask students to write a least five examples of each type of heat transfer.

Bibliography

Fienberg, Anna The Hottest Boy Who Ever Lived (Albert Whitman & Company, 1993)

Authors

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