Heat Transfer

Three Types

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6th Grade
Science/Dance

Objective:
In a 60-minute class 6th grade students will explore heat transfer by creating movement sequences based on locomotor steps and speed.

Science Core
Standard 6
Students will understand properties and behavior of heat, light, and sound.
Objective 1
Investigate the movement of heat between objects by conduction, convection, and radiation.

Dance Core
Standard 1
The student will identify and demonstrate knowledge of the body and movement skills in performing dance.
Objective 2
Identify and execute axial and locomotor steps.

Experiment One: Conduction Heat Transfer
Conduction heat transfer can only be done when a hot source is touching a cooler source.

Materials: Cardboard, Metal, Cloth, Styrofoam, Wood, Glass, and Plastic. Signs of materials, shapes and locomotor steps.

Music: Happy (Gru's Theme from Despicable Me 2) by Pharrell Williams

Science Activity: Put your hand of the objects in front of you. You will feel that they have different temperatures. Put them in order from cold to warm. Describe, that even though they all are the same temperature, why they feel like they have different.

Dance Activity: Assign a locomotor step to each object. Decide on a shape that everyone will make. Practice the speed of each. Put the objects in order from cold to warm, line them up. Assign two or three students to each object, make the same shape, and transfer from one side of the gym to the other. Make sure one is faster then the other.

Experiment Two: Convection Heat Transfer
Convection heat transfer can only be done in liquids or gases. As hot liquids or gases rise, cold liquids or gases take the place of hot liquids or gases.

Materials: Clear plastic cups, Thermometers, Ice cold water, Blue food coloring, Room temperature water, Hot water, Red food coloring, Paper towels, and Small syringe. Scarves or noodles.

Music: Tutti-Frutti (Rock and Roll Guitar) by Little Richard.

Science Activity: Fill two transparent cups with room temperature water. In one cup, put blue ice water at the bottom with a syringe. Put red hot water at the top of the same cup with a syringe. Describe the results of what happened and tell why. In the other cup, put red hot water at the bottom with a syringe. Put ice water at the top of the same cup with a syringe. Describe the results of what happened and tell why.

Dance Activity: Have students find a partner. Assign colors to hot and cold scarf or noodle. Decide a dance step that everybody will do. Example: moonwalk, sprinkler, worm, shuffle, etc. When the music starts they will do their step, when the music stops the will make a shape. If they have the hot scarf, they will make a high shape, and cold scarf will make a low shape.

Experiment Three: Radiation Heat Transfer
Radiation heat transfer can go through any type of medium. This is why cars in the sun with the windows closed and homes with the windows closed get hot in the summer. The heat goes through the metal and windows of the car and the brick or wood of the house. This is also why you get sunburned in the sun and cook hotdogs and marshmallows over a campfire.

Materials: 4 thermometers, Tin can, Styrofoam cup, Plastic cup, Paper cup, and Lids for each cup.

Music: Tutti-Frutti (Rock and Roll Guitar) by Little Richard.

Science Activity: Fill up four cups made of different materials with hot water and put lids on them. With a small hole in the lid for a thermometer to fit through, put a thermometer in each cup. Take a reading every three minutes. Describe what is happening with the temperatures in each container. Tell how this experiment shows radiation of heat transfer.

Dance Activity: Decide which cup lets heat out faster. Line up the cups in order of speed. Decide a dance step that everybody will do. Example: moonwalk, sprinkler, worm, shuffle, etc. Do the same step at different speeds depending on the cup material. Teacher calls out the material.